TELEPHONE ENGINEER

Volume 30 NOVEMBER, 1926 Number 11

ASSOCIATION CAN END COST DATA FAMINE

An interesting suggestion was made by Mr. A. L. Stadermann at the plant division conference at the national convention relative as a basis for unit costs. to the use of weights of poles Briefly the suggestion works this way: if the cost of placing poles is $10 per thousand pounds, the cost of erecting a pole weighing 250 pounds would be $2.50.

The question immediately rose in the minds of some of those present as to whether this would apply to poles set by hand or poles set by a pole derrick. Are costs of digging and setting poles actually proportional to weight of the poles when the holes are dug by hand or by a digging machine? Many opinions were expressed, but no one seemed to have sufficient data of actual costs by which the suggestion could be tested.

This is a condition that exists widely in the telephone industry. There are many men in construction department who can determine the quantities of plant to be installed on a given job and can make a reasonably accurate estimate of the cost of the job. When the job is done, however, there is no record available which will permit the determination of the actual cost by units such as poles, cross arms, etc. There is usually not even a satisfactory record of the man-hours required to perform each unit of the work.

As a result of this, in cases involving valuation of property there is no evidence to present when an examiner questions the accuracy of the units used. In a recent hearing, an examiner objected to certain units and made the statement that a good workman should dig ten holes a day—that he had dug more than that when he was a boy on the farm. Needless to say, the examiner was comparing incommensurable things, but the only evidence to present against his opinion was the opinion of others. No one in the case had actual figures.

It is not possible to say whether the suggestion of Mr. Stadermann is workable until it is tested by sufficient cost data to determine its accuracy. The point we wish to bring out is that there is not sufficient cost data available —at least it has never been collected and co-ordinated—to test the theory. One of the things that is badly needed in the plant and engineering departments of the industry is more cost information. Commissions and valuation engineers need it for rate cases. Plant engineers need it for estimating and plant supervisors need it for determining the efficiency of construction forces. Even the foremen on the job need it as an incentive to production at lower cost.

It seems to us that one of the major projects by the plant division of the national telephone association might well be made the collection and distribution of information on the cost of typical construction jobs.

STUDY RADIO LEGISLATION

The radio broadcasting situation continues to become more and more confused as additional stations are licensed and existing stations continue to "jump" waves assigned to other stations or take waves which do not preserve the separation of ten kilocycles between channels. There is no relief in sight until congress meets and passes regulatory legislation.

Two bills were before congress during the last session—the Dill bill calling for the creation of an independent regulatory commission and the White Bill continuing radio transmission under the control of the Department of Commerce. Neither of these bills seems to be entirely satisfactory and it is doubtful if law can be framed that will be universally approved by all interests concerned. The danger is that the law that will finally be passed will be the result of political log-rolling rather than of careful study of the needs of the industry.

On principle, we are opposed to the Dill bill, as there is no apparent need for the creation of another independent commission that will function without supervision except from the executive office. The control of radio may well be placed in the hands of one of the existing governmental departments and adequate powers and provisions for its administration be given.

The telephone industry is becoming increasingly interested in radio as an extension of its serv-

ice and as a means of new service in the distribution of programs over local wire circuits. Telephone managers are urged to study the proposed legislation and make their views known to their representatives.

A CURE FOR GUESS-WORK IN PLANT ACCOUNTING

"There has been too much guess-work in plant accounting," said one speaker at the accounting conference at the national convention of Independent companies. This had particular reference to the removing of plant from service and the making of proper credits to appropriate plant accounts and charges to depreciation reserve. In a telephone plant it is impossible to know the original cost of a vast majority of the units and the estimates which have been used have certainly been made in a haphazard fashion in very many cases.

In reality, there are three principal elements in an accurate method, an agreed list of units; accurate reports by foremen of the plant displaced and a proper set of unit costs in the hands of the accountants. After three years' work the recommendations of the accounting division as to a list of units have been completed and approved by the association; a system of reports has been worked out and a method developed for determining unit costs. Complete details are given in the two handbooks prepared by the accounting division which may be obtained from association headquarters.

The system developed is not complicated and is suitable for use in accounting of class A and B companies and with little modification by Class C companies. If every company of these classes will secure copies of the handbooks and will apply the principles set out to their own local conditions, most of the guesswork that has heretofore characterized plant accounting methods will disappear.

CHECK OVER YOUR STOCK BEFORE THE STORM

If the sleet demon visited your plant tomorrow, tearing down wires and breaking off poles like matchwood, how would you find yourself supplied with the necessary material for temporary and permanent replacement? Could you move the materials quickly to the job from your own warehouse and pole yard or would you have to telephone or telegraph to your supplier and take your chance of getting materials along with hundreds of other companies?

Now is the time to check over stocks of poles, wire, cross arms, hardware and the other material that goes to make up the telephone plant to make sure that a reasonable supply is on hand to provide against the storm that we hope will not come, but which experience has taught us to expect with disconcerting regularity.

WHERE WILL IT STOP?

The steadily mounting burden of taxation on telephone companies prompts the question, "Where will it stop?" In the study recently made by Prof. Herbert R. Dorau of Northwestern University, it was shown that taxes assignable to operations of Class A telephone companies had arisen from $15,710,912 in 1916 to $61,627,223 in 1925. Of course there is vastly more telephone property now than in 1916 and revenues are much higher, but that taxes are growing at a disproportionate rate is shown by the fact that taxes amounted to 5.55% of total revenue in 1916; 6.19% in 1920 and 7.79% in 1925.

In the final table of the study was shown that companies paid as taxes all the way from 3% to 34.6% of their operating income before taxes. The average for 1925 was 27.8%. In practically all of the comparisons it was shown that the total amounts of taxes and the proportion to other expenses has increased steadily. In the discussion of taxation at the national convention it was stated by one speaker that the industry must look forward to a still greater increase in taxes during the next few years.

The telephone industry is willing to pay its full share of the cost of maintaining the various governmental bodies, but the increases in taxation to which it has been subjected make it a matter of question as to whether it is not being called upon to bear more than its just share. Unlike the ordinary business, the telephone company cannot meet an increase in taxes by an immediate increase in the price of its product. It must wait perhaps years until its next rate adjustment. While it ultimately must pass on the burden to its customers, there will be an interval in which it will have to bear the burden itself. For this reason, telephone men individually, and the industry as a whole, can well give much study to its tax problems and to the general problem of raising funds for public purposes by taxation. It is a subject of vital interest.

TELEPHONE ENGINEER

225 N. Michigan Ave., Chicago.
Vol. 30. November,
No. 11. 1926

Entered as second-class matter, June 6, 1922, at the post office at Chicago, Ill., under the act of March 3, 1879.

SUBSCRIPTIONS

The subscription price of TELEPHONE ENGINEER is $2 a year in the United States, Cuba and Mexico; in Canada it is $3; in all other countries $4. Single copies, U. S. A., 20 cents.

ADVERTISING

TELEPHONE ENGINEER is issued the 15th of each month. Copy can be accepted as late as the 8th of the month preceding date of publication. Where proof must be seen, allow ample time for transmission in the mails. Display Advertising — Rates on application. Classified Advertising—"Wants," "For Sales," etc.—$4 an inch, or 7 cents a word per insertion.

Telephone Displacing Telegraph with Railroads

Washington, D. C.—The Class 1 railroads of this country are becoming better users of the telephone with each passing year. At the beginning of this year they had 132,850 miles of telephone lines in operation, a gain of 13,000 miles during the last five years. During the same five-year period the number of miles of telegraph lines were reduced by about 13,000 showing that the telephone is taking the place of telegraph in the handling of trains.

Properties and Design of Electromagnets*

By F. J. DOMMERQUE
Fellow A. I. E. E.

34. Magnetizing Curves

Forming a wire into a coil and sending a current through it will cause the lines of force to thread the coil axially; that is, to follow in the inside of the coil the direction of its axis as illustrated in Fig. 27. The full drawn lines represent the convolutions of the coil, the arrowhead at each end indicating the direction of the flow of the current, the dotted lines

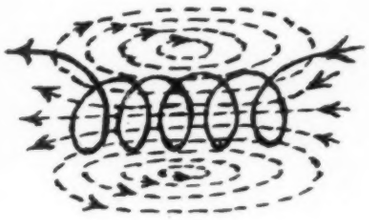

Fig. 27

represent the lines of force, the arrowheads indicating the direction of the lines. If a rod of soft iron is inserted in the coil to form a core, the lines of force will penetrate the rod and transform it into a magnet. The latter will retain its magnetism as long as the current flows in the coil, but de-magnetizes again as soon as the current ceases to flow, because the magnetic field disappears at the same time. Steel rods or cores retain the magnetization much longer than soft iron cores.

By the insertion of a rod or core of iron or steel into a coil carrying a current an *electromagnet* is obtained, whose magnetism can be increased by increasing either the current flowing in the coil or by increasing the number of turns in the coil. But there is a limit to this increase, which limit is known as *saturation*. Although actual saturation is never reached, magnetization in practice is not pushed quite up to saturation. In order to have a guide in construction of electromagnets, curves of magnetization are drawn of different magnetic materials. Two examples of such curves are shown in Fig. 28 and 29. Fig. 28 shows the magnetizing force for cast iron and Fig. 29 for wrought iron. There are three scales to each set of curves; the scale along the ordinates gives the magnetic induction or the magnetization B per square centimeter of the material, the scale for the abscissae marked along the upper edge of the drawing gives the magnetizing force H in C.G.S. units, while the scale along the axis of abscissae gives the magnetizing force H in ampere-turns per centimeter

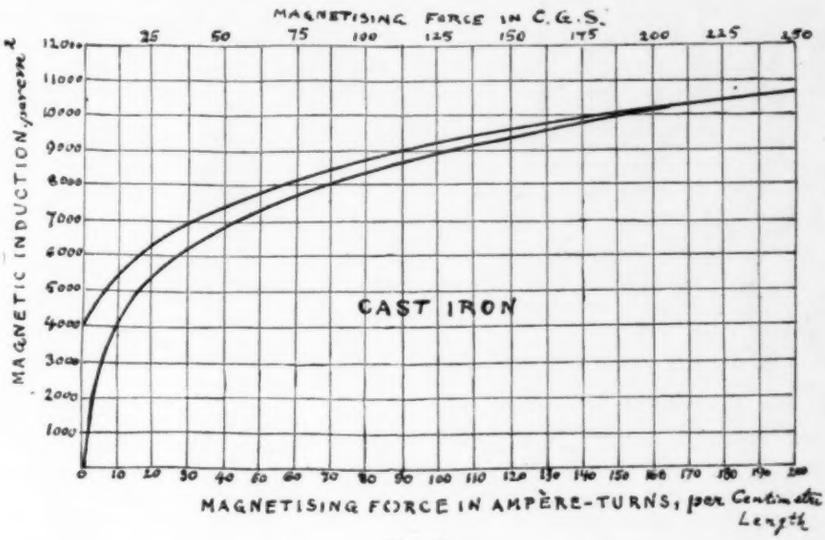

Fig. 28

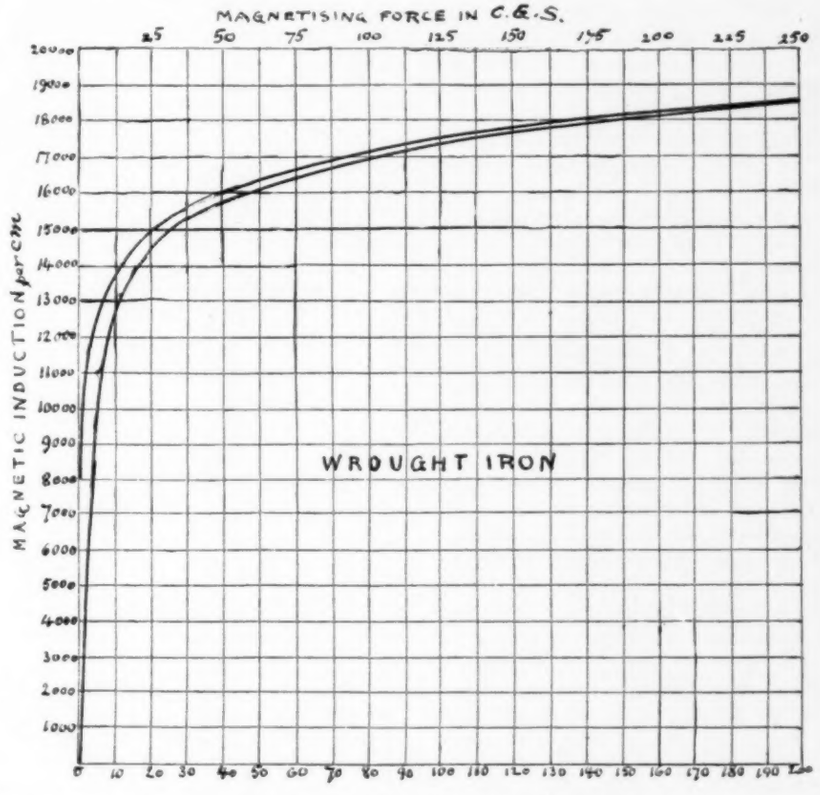

Fig. 29

*Eighth article on Telephone Mathematics and Physics.

length of coil. *Ampere-turns* is the customary designation for the product of the number of turns of a magnet coil into the number of amperes flowing through it. Thus the same effect of magnetization is obtained whether the current is large and the number of turns in the coil is small, or the current is small and the number of

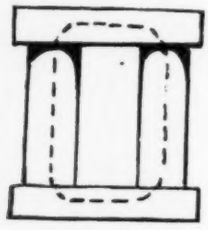

Fig. 30

turns large; it all depends on their product. In design of electromagnets the decision as to proportion is made by other considerations such as heating of the coil, winding space, etc.

The C.G.S. unit of magnetizing force is the "gilbert per centimeter." The magnetizing force in a magnetic circuit linked with N turns of wire carrying a current of i amperes is $\frac{4\pi}{10}$ Ni gilberts per centimeter or Ni ampere-turns per centimeter. Therefore, to express the magnetizing force H in a given coil, we have the formula: $H = \frac{4\pi}{10} \times \frac{Ni}{l} = 1.2566 \frac{Ni}{l}$, where l is the length of the coil in centimeters.

The relation between gilberts and ampere-turns is therefore: 1 gilbert per centimeter = 0.7958 ampere-turns per cm., or = 2.021 ampere-turns per inch.

Incidentally it may be mentioned that various names have been given to a unit of magnetic induction, but lately the name *"maxwell"* has been favored. One maxwell $=10^{-8}$ volt-second. One maxwell per $cm.^2 = 6.542$ maxwells per square inch.

35. Magnet Cores

An iron core suitable for telephone work; that is, whose magnetization must be able to follow the rapid undulations of the currents, needs of necessity to be short to secure mobility to the lines of force, and often must be built up of fine wires to avoid the retarding effect of magnetization, besides requiring that the iron itself be as soft as possible so that the magnetization can always be proportional to the magnetizing current. Therefore, where the quick and accurate accommodation of the magnetization to the magnetizing force is essential, short open-circuit cores are proper, where strong magnetization is essential only, long magnets, or, better still, closed rings of iron are most effective.

When discussing hysterisis, we spoke of iron dust cores. While solid iron cores are employed for drops, relays, ringers, switch magnets; iron wire cores for induction coils, retardation coils; iron dust, that is, compressed powdered iron has been chosen as material in the construction of loading coils to obtain the required constancy of permeability over the range of magnetizing force corresponding to the normal range of telephone currents.

36. Magnetic Circuit

For the flux of magnetic induction a complete magnetic circuit is necessary. The airgap required in an electromagnetic relay or in a machine to allow for free movement of the armature is part of the

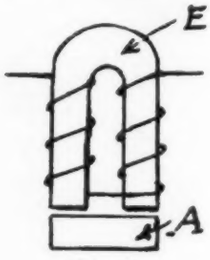

Fig. 31

magnetic circuit, it does not act as a magnetic insulator. There may be one or more airgaps in the magnetic circuit, which consists for the greatest part of iron, the magnetic flux changing as gradually as possible. In Fig. 30 is represented a closed magnetic circuit, that is, one not having an airgap. In the figure it consists of two round cores, a flat yoke (at the bottom) and an armature (on top), all of which form a typical electromagnet. The lines of induction in the cores are practically straight. In the yoke and armature, however, the lines of induction bend around somewhat, as indicated by the dotted line. This dotted line, passing along the center, may be considered throughout as the average length of the magnetic circuit. If the entire

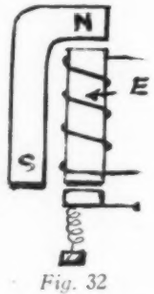

Fig. 32

frame is made of Swedish iron, the curve of induction would give 16,000 lines per $cm.^2$ as the most economical number to use.

In Fig. 31 an open magnetic circuit is illustrated, where the armature A is located in such a manner in the path of the lines of force that the electromagnet E can attract it. In such an electromagnet the core as a rule is of soft iron. The attraction of the armature is effected solely by the field of the current flowing in the coil; the direction in which the current flows through the coil is immaterial, if the current is large enough the armature will be attracted.

Fig. 32 represents in general outlines a "polarized" electromagnet. In this ar-

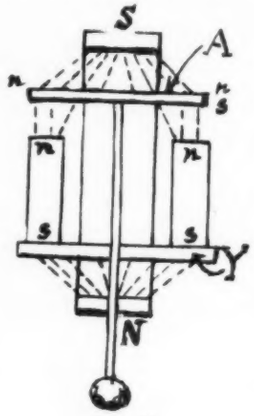

Fig. 33

rangement NS is a permanent magnet, N being its north pole and and S its south pole. Its lines of force permeate the core of the electromagnet E, which is thereby magnetized. The armature in the figure is shown as held by a spring, the tension of which may be regulated so as to prevent attraction that is, closing of the armature, as long as the electromagnet E is magnetized by the permanent magnet only, which is the case when no current flows in the magnet coil. As soon as current commences to flow in a certain direction the armature can be attracted; the direction must be such that a field is generated in the same direction as the field of the permanent magnet. Should, however, the current flow through the magnet coil in the opposite direction, the field due to the effect of the permanent magnet is weakened and the armature cannot be attracted.

If we give the core of the electromagnet the form of a horseshoe by connecting two round cores as in Fig. 33 by a yoke Y, and if the permanent magnet NS polarizes the system in such a manner as to cause an equal distribution of lines of force by the permanent magnet NS over the two cores as indicated in Fig. 33 by the dotted lines, the magnetism of the one core will be increased by sending current through the magnet coil, while the magnetism of the other core will be decreased. According to the direction of the current one or the other core possesses the stronger magnetism. Thus, if current flows through the winding of the electromagnet alternately in positive and in negative direction the armature A pivoted at its center point will rock to and fro. A clapper attached to such an armature will ring a bell of a polarized alternating current ringer, which is shown in skeleton form by the Fig. 33.

If the cross sectional area A of the

parts, of a magnetic circuit is constant; if the length of the magnetic circuit is l and the permeability of the iron is μ, the reluctance or magnetic resistance can be expressed as $\frac{l}{A\mu}$. Hence the magnetic flux $\Phi = \frac{1.2566\,Ni}{\frac{l}{A\mu}}$ (dimensions in cm.).

If in the magnetic circuit illustrated in Fig. 30 the armature is separated from the poles so as to introduce two airgaps as shown in Fig. 31, the reluctance for the airgap part of the circuit is greatly increased, as permeability of air is one. Thus the reluctance of the magnetic circuit would consists of two parts, the iron part $= \frac{l}{A\mu}$ (uniform cross sectional area assumed), and the airgap part $= \frac{2l_1}{A_1}$, if there was no leakage of lines. There is, however, some leakage even when the armature is in contact, but when the armature is moved out, the leakage increases rapidly with increased length of airgap. In calculations a coefficient "v" of allowance for leakage is employed, such that v times the number of lines that are wanted to pass through the armature must be allowed for in the magnet cores and in the yoke.

Thus the total flux will be to the useful flux as u + w to u, where u is the reciprocal of the magnetic reluctances along the useful path of lines found as $\frac{l}{A\mu} + \frac{2l_1}{A_1}$, which is called the *"permeance,"* and w the permeance along the wasted lines of the stray field. Consequently $v = \frac{u+w}{u}$.

The reluctance, however, along the path of stray lines represents a more difficult problem. For estimating the permeance, that is, the reciprocal of the reluctance, between cores and pole areas the following data are available:

(1) Permeance between two parallel cylindrical limbs or cores of iron. Let p be the circumference of cylinder (that is, of the round core) and b the shortest distance between the two cores arranged similarly as shown in Fig. 30; then the curve in Fig. 34 will give the reluctances corresponding to the ratios $\frac{b}{p}$ in C.G.S. units, unit length of cylinder cores assumed. The permeance is the reciprocal. The values for permeance determined from the curve should be divided by two, as the average difference of magnetic potential over the leakage surface is only about half that at the ends of the poles.

(2) Permeance between two parallel areas facing one another. Let the areas be A_1 and A_2 cm.^{2} and the distance between them between d cms., then permeance $= \frac{A_1 + A_2}{2d}$. See Fig. 35.

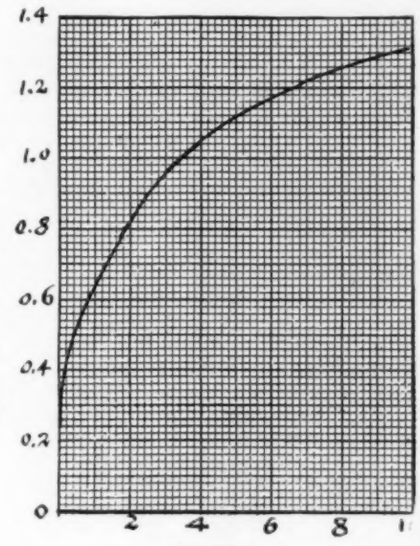

Fig. 34

If the dimensions of the magnet frame are given the winding to produce the required magnetic flux through the armature is as follows: Let Φ designate the number of lines that have to pass through the magnetic circuit; let l_1, l_2, l_3 be the lengths respectively of the magnetic circuit parts in armature, one airgap and iron part of cores and yoke; A_1, A_2, A_3 the corresponding cross sectional areas; μ_1, μ_2 and μ_3 the corresponding permeabilities ($\mu_2 = 1$ for the airgap); and v the coefficient of allowance for leakage; then assuming there are two airgaps, the total number of ampere-turns required will be:

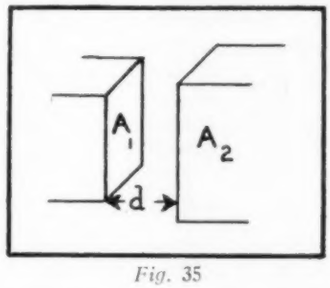

Fig. 35

Fig. 36

$$Ni = 0.7958\,\Phi\left[\frac{l_1}{A_1\mu_1} + \frac{2l_2}{A_2} + \frac{vl_3}{A_3\mu_3}\right]$$

if all dimensions are in cms., and

$$Ni = 0.3132\,\Phi\left[\frac{l'_1}{A'_1\mu_1} + \frac{2l'_2}{A'_2} + \frac{vl''_3}{A'_3\mu_3}\right]$$

if all dimensions are in inches.

37. Winding and Heating of Electromagnets

The ordinary type of straight core electromagnet as illustrated in Fig. 36 we have already discussed in the first paragraph of this paper (§ 34). Instead of having a single wire wound around the core, two wires may be wound together around it like it is shown in Fig. 37. In this figure the two wires are shown of different thickness; this is only done for distinction, in practice the wires can be of the same gage. Suppose a current flows into the heavy drawn wire at 1 and around the core to point 2; suppose 2 is connected to the second wire at point 4 and the same current flows on from 4 to 3; in such a case no magnetization of the core takes place, if the number of turns of each one of the two wires are equal and the wires are of the same gage, because the magnetizing force in the winding 1-2, being of opposite direction to the magnetizing force in the winding 4-3, the two forces balance and there is no effect. A winding of this kind where the two wires for going and returning current are wound side by side is called *"bifilar winding."*

The same result could have been obtained by winding a single wire into a coil around a core as shown in Fig. 38,

Fig. 37

with a tap of the wire at the middle of the coil so as to divide the wire into two equal halves. If now the current enters at point 1, it divides into two equal parts, one-half flowing from 1 to 2 and the other half to 3. In this case also no magnetization is effected. This kind of winding is called *"differential winding,"* because in case the current flows from 1 to 2 and 3, no magnetization takes place

Fig. 38

and therefore no action; if, however, the current enters at 2 and flows out at 3,

or if the current enters at 3 and flows out at 2, the core is magnetized first in one direction and then in the other direction.

It must not be lost sight of that we are always assuming direct or continuous currents; in the design of magnets for alternating current work other points have to be considered such as inductance and impedance. These effects do not interest us for the present.

With a given magnet frame the winding space is fixed. The question arises, what is the most economical size of wire to use. If the voltage is constant, the ampere-turns are not altered by putting on more wire so long as the size of the wire and the length of a turn remain the same, because the amperes are reduced in the same ratio as the turns are increased, but the power consumed is inversely proportional to the number of turns used. This is a consequence of *"Joule's law,"* which states: the heat produced by an electric current I in a conductor having a resistance R during the time t equals cI^2Rt. The constant c is the amount of heat generated by unit current in a conductor of unit resistance during one second. One watt generates per second an amount of heat capable to elevate 0.24014g water from 0° to 1° centigrade. (As remarked on previous occasions it has become customary in physical work to use the gram as measurement of weight and to express temperatures in degrees Centigrade. There are tables on hand to transform metric weights into pounds, and also to transform degrees centigrade into degrees fahrenheit and vice versa.)

By Ohm's law $E = IR$; (in our last article we stated this law by saying that potential difference equals resistance times current, or volt-ampere times ohm. The power of a current is expressed by the product of volts into amperes; the product volt-ampere is commonly designated as "watt"; hence watt $= EI$, where E designates the volts and I the amperes. If we substitute for E the value IR, we obtain the power of a current in watts as $EI = IR \times I = I^2R$; this is generally called the *I^2R loss,* as it is expended in overcoming the resistance.

The usual course is to design magnets, which are to be constantly excited, with a view to keeping the heating of the wire by the current within assigned limits, and at the same time to keep within reasonable limits of size.

The actual temperature to that end depends on so many things that it is practically impossible to calculate it accurately. It may suffice to say that heating needs only to be taken in consideration in the design of magnets which are to carry current for considerable periods of time. For small magnets as used in telephone work, the heating is altogether negligible.

Large direct current electromagnets are relatively more economical of power than small ones, for the larger magnet with n times the power gives n^2 times the total induction, the relative volume of the winding being the same as in the smaller one, so if it is required to make the smaller magnet relatively as economical of power as the larger one, the relative volume of winding must be increased.

It must also be taken in consideration when determining magnet windings, the variation in insulation; that is, the fact that with decrease in diameter of the bare wire the thickness of insulation respectively the relative amount of space occupied by the insulated wire increases, as can easily be learned from tables of thickness of insulation prepared by the various manufacturers of wire.

In winding large magnets with comparatively heavy wire, the winding space required can be calculated with considerable accuracy; in winding small magnets with rather fine wire it is customary to wind a trial layer of the wire on a smooth round stick and count the number of turns to an inch. It is also customary to insert a layer of stiff paper at intervals between the layers of windings on small magnets to obtain regularity of winding, for which an allowance of from 10 to 20 per cent of the winding space may be made. G. L. Hedges has worked out a set of formulae which may be helpful to anyone desirous of making winding calculations. He uses the following notation in his formulae and gives all dimensions in inches and weights in pounds, but uses centigrades for the temperature.

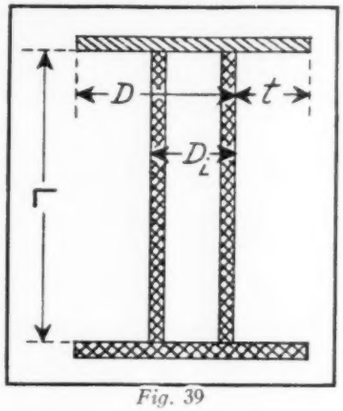

Fig. 39

D = mean diameter of coil in inches. This is the dimension over the thickness of the core plus the insulation plus one-half of the depth of winding space on either side This amounts to the same as measuring from the one side of insulation of the core to the outside of the winding space on the other side, as indicated in Fig. 39.

D_1 = inside diameter of coil in inches.

d^1 = diameter over insulation of insulated wire. In inches.

E = voltage applied to coil.

I = current in amperes.

k = a constant for adjacent sizes of wire. (See Fig. 40.)

L = length of coil in inches.

P_s = watts per square inch of radiating surface $= \frac{P}{S}$.

P = watts applied to coil.

P_w = watts per pound of copper $= \frac{P}{W}$.

R_a = resistance of coil at $a°$ centigrade in ohms.

S_a = resistance in ohms per foot of wire at $a°$ centigrade.

S = radiating surface in square inch.

θ = temperature rise of coil in degrees centigrade.

θ_s = rate of temperature rise in degrees centigrade per second.

t = thickness of coil in inches.

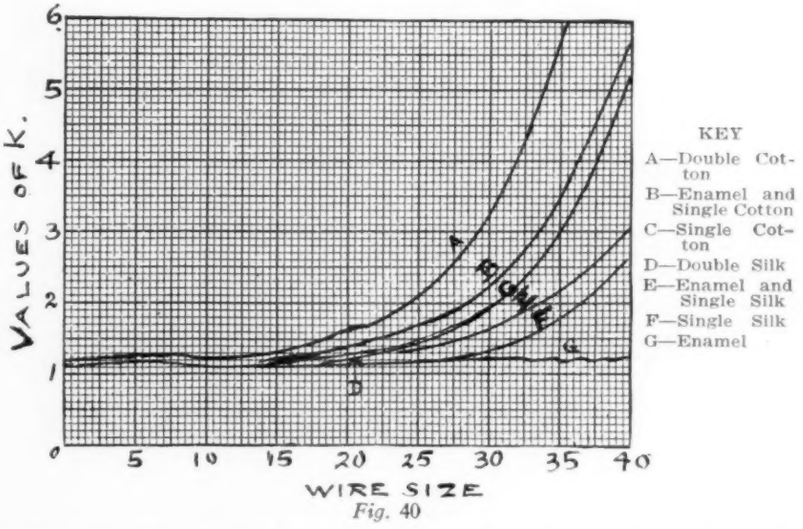

Fig. 40

W = weight of copper in coil (pounds).

W^1 = weight of insulated wire in coil (pounds).

w = weight per foot of bare wire (pounds).

w^1 = weight per foot if insulated wire (pounds).

Y = number of layers of wire in coil.

For continuous service of the coil a radiation of 0.4 watts per square inch (0.062 watt per cm.²) may be allowed for about 40° centigrade temperature rise, or $P_s = 0.4$.

For intermittent service a temperature rise of 80° centigrade at the end of 120 seconds is a conservative rating, then

$$\theta_s = \frac{80}{120} = 0.67^\circ \text{ centigrade per second.}$$

The working formulae are as follows: Given Ni (ampere-turns), D_1 L, E; assumed value of P_s or θ_s, and value of k for assumed trial wire size (see Fig. 40).

1. Find t. (a) for continuous service

$$t = 0.5255 \frac{k}{P_s} \times \left(\frac{Ni}{L}\right)^2 \times 10^{-8}.$$

(b) for intermittent service

$$t = \frac{kNi}{L\sqrt{\theta_s}} \sqrt{0.01948} \times 10^{-3}.$$

2. Find mean diameter of coil $D = D_1 + t$.

3. From a wire table find the nearest wire size corresponding to the value of

$$S_a = \frac{12}{\pi} \times \frac{E}{D} \times \frac{1}{Ni}.$$

Repeat steps, 1, 2 and 3, with the above as assumed trial wire size, if the first assumed size is more than two or three numbers different from the above value.

4. Find weight and resistance of coil, thus:

$$R_a = \frac{\pi}{12d^1} \times DYL \times S_a.$$

$$W = \frac{\pi}{12d^1} \times DYL \times w.$$

$$W^1 = \frac{\pi}{12d^1} \times DYL \times w^1.$$

38. Traction of Magnets

The traction or lifting power of a magnet has been stated by Maxwell as follows: If T is the traction per square centimeter and A the cross sectional area of the magnet, then $\frac{B^2A}{8\pi}$ (in dynes) = $\frac{B^2A}{8\pi \times 981}$ (in grams), or with an accuracy of nearly one per cent

$$T = \left(\frac{5{,}000}{B}\right)^2 A \text{ kilogram}$$

If pounds are used, divide by 453.6, then $T = \frac{B^2A}{11{,}183{,}000}$; and if inch measured are used $T = \frac{B^2A}{72{,}134{,}000}$ (in pounds and inches).

B designates the magnetic induction; that is, the number of magnetic lines to the square centimeter or square inch as the case may be. Thus the traction of a magnet is proportional to the square of the intensity of the induction. The following table gives the traction value for different values of B:

Table of Magnetic Traction

B lines per cm.²	B lines per sq. in.	Dynes per cm.²	Grammes per cm.²	Pounds per sq. in.
1,000	6,450	39,790	240.6	0.577
2,000	12,900	159,200	162.3	2.308
3,000	19,350	358,100	365.1	5.190
4,000	25,800	636,600	648.9	9.228
5,000	32,250	994,700	1,014	14.39
6,000	38,700	1,432,000	1,460	20.75
7,000	45,150	1,950,000	1,987	28.26
8,000	51,600	2,547,000	2,596	36.95
9,000	58,050	3,223,000	3,286	46.72
10,000	64,500	3,979,000	4,056	57.68
11,000	70,950	4,815,000	4,907	69.77
12,000	77,400	5,730,000	5,841	83.04
13,000	83,850	6,725,000	6,855	97.47
14,000	90,300	7,800,000	7,550	113.1
15,000	96,750	8,953,000	9,124	129.7
16,000	103,200	10,170,000	10,390	147.7
17,000	109,650	11,500,000	11,720	166.6
18,000	116,100	12,890,000	13,140	186,8
19,000	122,550	14,630,000	14,630	208.1
20,000	129,000	15,920,000	16,230	230.8

Bell New Plant for First Nine Months 1926, $185,000,000

New York City—President W. S. Gifford of the American Telephone and Telegraph company says the growth of the business of the Bell system continues at a normal rate. During the first nine months of the year the company and its associated companies have made net additions to their plants costing over $185,000,000. This new construction provides necessary plant and equipment for over 520,000 additional telephones installed since the beginning of the year.

Camp Point, Ill.—Illinois Telephone Co. of Jacksonville has bought the local telephone company from C. E. Tracy. H. S. Stockton remains as manager.

Sulphur Springs, Ark.—A. D. Johnson has bought the local telephone plant from N. Graham.

Formation of Commercial Division Considered at U. S. I. T. A. Board Meeting

Chicago, Ill.—Success of the accounting, plant and traffic division of the U. S. Independent Telephone Association has been responsible for a well defined urge for the establishment of a commercial division within the association, President F. B. MacKinnon told the board of directors of the association at their annual meeting.

Half of the Independent industry problem of a year or so ago—men and money—has been solved, the Independent chief said. Money is forthcoming at a rate that calls for some vigilant supervision lest there be some wild and wooly financing to bring the industry's securities into evil repute. Mr. MacKinnon severely condemned the practices of some engineers who make appraisals without due regard to safety and thus allow the issuance of securities on which it is impossible to make enough to properly care for depreciation.

A number of new companies were favorably passed upon as association members and their induction into the ranks voted. The report of Secretary-Treasurer Charles Deering was received. It showed the association in good financial shape.

Report of the executive committee's conferences held with officials of the A. T. and T. Co. also was made to the board.

Warning of the peril in the constantly increasing taxation to which telephone companies were subjected was given to the board by President MacKinnon and discussed at length. The board also considered impending radio legislation.

"Wired Radio" Men Organize at Chicago

Chicago, Ill.—During the convention of the U. S. I. T. A. those who have been active in distributing radio programs over telephone wires to homes, business establishments and institutions organized the National Radio Program Service Association.

Officers elected were:

Pres., J. A. Gustafson, Fredonia, Kan.

V. P., T. L. Youmans, Osawatomie, Kan.

Sec.-Treas., Don Daso, Jefferson City, Missouri.

Additional members of the executive committee are: L. W. Scherer, Yale, Okla.; L. O. Painter, St. Paul, Minn.; R. S. Brewster, Lincoln, Neb., and E. D. Glandon, Pittsfield, Ill.

cussed by the 50 men present at the organization meetings. The next meeting is to be held in January, the time and place to be determined by the executive committee.

International Gets Belgian Cable Order

New York City—The International Telephone and Telegraph Corp. announces that the International Standard Electric Corporation's allied cable company in Belgium, "Ateliers Des Constructions Electriques de Charleroi," has received an order from the Belgian Administration for interurban toll cables, extending from Brussels to Luxembourg and from Brussels to Mons-Charleroi, to the value of Belgian francs fifty-seven million (57,000,000)

Independents' Thirtieth Annual Meet Stirs Big Attendance

Chicago, Ill.—Telephone men in large numbers from nearly every state in the country flocked to Chicago to attend the national convention of the United States Independent Telephone Association held at Hotel Sherman October 12 to October 15. With an attendance of more than 800 and with a well balanced series of programs of topics of unusual interest, at times the large convention hall was packed to the extent that "standing room only" was available. Not only were the general sessions well attended but large numbers attended the divisional conference which for the first time were held in the form of luncheon meetings.

As usual the first session on Tuesday afternoon was in the nature of an organization meeting at which reports of the various officers and chairmen of division committees were made and the convention committees were appointed. President MacKinnon called attention to the fact that this meeting was the beginning of the 30th annual session of the Independent telephone industry. Secretary C. C. Deering of Des Moines, Iowa, then presented the secretary's annual report. The financial report based on the calendar year of 1925 and a report for 9 months of 1926 showed that the income and expenditures of the association are just balanced; the activities of the association being limited to some extent by the funds available for use. The membership of the association now stands at 656 operating companies, 70 manufacturers and 40 miscellaneous, making a total of 766 members.

Report of the Accounting Dvision

In the absence of Chairman A. C. Cragg of the Tri-State Tel. & Tel. Co., of Saint Paul, Minn., the report of the accounting committee was read by F. J. Tellman of Fort Wayne, Ind. In substance the report is as follows:

A year ago the committee reported that it was hard at work on a program that it felt was badly needed. At the meeting of the Class "A" companies notes have been compared as to earning and expenses and ways and means discussed of increasing gross earnings or decreasing expenses. It is strongly urged that these meetings be carried on so that A, B and C companies can get together yearly and talk over frankly the different phases of the business.

Attention was called to two handbooks which the accounting division had issued during the past year and which were being distributed by the national association offices. The book called "Instructions to Employes Covering Classification of Plant and Maintenance Accounts" should be carried by every plant man of every company. If it is put into general use, distribution of cost in connection with the plant accounts will be the same with every company. The other book known as "A Uniform System of Accounting for Fixed Capital, Maintenance and Depreciation, applicable to Class A and B Telephone Companies" is an important addition to telephone accounting. There has been a great deal of guess work as to prices that should be applied for credits to construction and debits to depreciation. A plan is outlined which will place the responsibility of removing plant into the hands of the accountant. The system is by no means difficult to understand nor costly to install.

There is much further work to be carried on; a book should be prepared for the smaller companies and there is work to be carried on with the Interstate Commerce Commission as it is understood that the Commission proposes to revise its system to make the account numbers line up for all classes of companies. There has been also considerable discussion of a uniform annual report.

Plant Division Report

Following the report of the accounting division, A. L. Stadermann, chief engineer of the Citizens' Independent Telephone Co., of Terre Haute, Ind., read the report of the plant committee.

The United States Independent Telephone Association holds membership in a number of important national committees on standardization, inductive coordination and simplified practices and is assisting in the standardization of some fifteen projects in which the telephone industry and other national industries are interested. Among the projects are manhole frames and covers; electric wiring regulations in respect to fire hazards; electrical safety code; lightning protection; tubular steel poles; miscellaneous line materials; dry cells; poe line insulators; zinc coating of iron and steel; hard drawn copper wire; wood poles; engineering symbols and abbrevations and drawing room practices. Among other proposed activities are wire gauges and screw threads. These projects are in various stages of completion.

The American Committee on Inductive Coordination has sub-committees at work on various tasks and to date has issued report No. 1 giving the organization, scope and personnel of the committee and a bibliography of the subject. During the spring meeting of the plant division special consideration was given to the subject of principles and practice of joint pole line construction with particular preference as to the forms of agreement in use. Work has also been done looking toward the preparation of a plant handbook.

Telephone companies are large users of printed forms and Mr. Stadermann outlined the waste now occurring due to diversity of sizes and kinds of paper. This portion of the report was illustrated by charts showing present and proposed sizes.

Traffic Committee Report

Secretary C. C. Deering, who is also chairman of the Traffic Committee, gave a synopsis of the work of the committee during the past year. A notable thing in the past year was the increasing number of regional traffic meetings for the discussion of traffic problems and for operator instruction. One of the most important activities of the committee was the completion of the operator's correspondence course in which 1031 operators are now enrolled. Most of them have been keeping up with the work in splendid shape, although a few have dropped behind due to illness, leaving the work, and other causes. The operation of the course is as follows: The

U. S. I. T. A.

Officers and Directors Re-elected at 1926 Convention

President, F. B. Mackinnon, Chicago.

Vice-Presidents: J. B. Earle, Waco, Texas; E. D. Glandon, Pittsfield, Ill., and Geo. W. Robinson, St. Paul, Minn.

Secretary-Treasurer, Chas. C. Deering, Des Moines, Iowa.

J. B. Earle, Waco, Texas.
Geo. R. Fuller, Rochester, N. Y.
W. F. Goodrich, La Crosse, Wis.
R. E. Gordon, El Paso, Ill.
H. L. Harris, Chicago.
C. L. Jones, Athens, Ohio.
Frank A. Knapp, Bellevue, Ohio.
G. W. Robinson, St. Paul, Minn.
Chas. A. Rolfe, Redlands, Calif.
E. D. Schade, Johnstown, Pa.
C. A. Shock, Sherman, Texas.

operator after enrolling is furnished a question sheet covering the first lesson using the toll operator's text and reference book as a basis. After she answers the question they are sent to headquarters where they are graded and the graded sheet is returned with a sheet giving the ideal answers. Upon completion a certificate is issued to the student.

Following the committee reports, a report of the activities of the Washington office of the association was given by Alfred L. Geiger. The Washington office is occupied with handling tax and accounting matters before the various government departments at Washington. A study of the question of the rights of state highway departments to compel moving of poles at company expense has also begun. Mr. Geiger strongly recommended that all matters with the Internal Revenue Department and the Interstate Commerce Commission be taken up through the Washington office in order that proper precedents may be established and followed.

Among other business matters disposed of at the first session were the appointment of the nominating committee and the introduction of many visitors to the convention.

Wednesday Morning Session

The session on Wednesday morning was one of the largest of the meeting, seating space in the convention hall being at a premium. As the first portion of the program, President MacKinnon presented his annual report covering general conditions and future problems in the industry. Mr. MacKinnon's remarks, in part, are printed elsewhere in this issue.

Following President MacKinnon's address a very timely paper on "Fundamental Principles of Sound Financing" was read by Herbert R. Dorau, assistant professor of Economics of Northwestern University, School of Commerce. Professor Dorau has made an extensive study of telephone financing as well as the general subject of financing, as indicated by his paper, which is digested on another page.

The third paper of the Wednesday morning session was by Harold L. Beyer of the law firm of Casells, Potter & Bently of Chicago. Mr. Beyer is well known to telephone men, having been connected with the industry for many years and being at present a member of the board of directors of the national association.

In speaking on "Some Legal Phases of Telephone Company Organization and Financing," Mr. Beyer stated in part: "The active executive officer of a telephone company, very early in his experience finds that the conduct of the business involves almost daily contact with numerous laws, legal limitations and restrictions, of one kind or another." He then told of some of the legal matters which affect a telephone company in the matter of the form of its organization or in the course of its customary activities, but especially with reference to the situation in which it is placed when it is necessary to justify a program of major financing.

Mr. Beyer then took up in detail, forms of organization, where to incorporate, preservation of charter rights, relations with public service commissions, long-term financing, and relations with financial houses.

"It is reasonable," said Mr. Beyer, "to expect that the coming years will see, as a result of the present tendency to consolidation in the Independent telephone industry and the growing realization on the part of the investing public of the soundness of the securities it has and will have to sell, an increasing number of large Independent companies, properly financed, efficiently serving in all parts of the country an ever widening constituency.

"That desirable consummation will be hastened if, in the present period of evolution, this association is encouraged to continue the great work it has already begun under the able leadership of President MacKinnon, of conveying information both to investors and to our own members as to the essential facts and problems inherent in the telephone business, and the difference between proper and improper methods of consolidating and financing our properties.

"It is of the utmost importance that all Independent securities offered for sale to the public shall be of high grade and economically sound. In that way alone shall we deserve the confidence of investors, and be assured of a flow of capital in sufficient volume to finance the legitimate needs of our developing industry."

Highlights of Mr. Beyer's address appear in this issue.

Following the conclusion of Mr. Beyer's paper the meeting adjourned for the various divisional luncheons which were exceptionally well attended, due not only to the general interest but also to the very able merchandising methods of Secretary Deering in disposing of the tickets.

Accounting Conference

The accounting conference of the convention met at luncheon in the main convention hall at noon, Wednesday, Oct. 13th, with a larger attendance than that of any previous meeting. A. C. Cragg, chairman of the accounting division, presided at the meeting and introduced Frank F. Fowler of the bureau of accounts of the Interstate Commerce Commission. Mr. Fowler spoke of the possibility of revision of some of the telephone accounting rules in 1927 and asked for the co-operation of the industry if such revision were undertaken. President MacKinnon spoke of the value of the work of the accounting committee and said that executives of various companies had learned much that they did not know about their own companies since the accounting work was undertaken. There was also some discussion of the report that the Comptroller of the Treasury in Washington would require telephone bills for government telephones to be made out on a prescribed form, in which discussion Mr. Cragg, Mr. MacKinnon, Mr. A. L. Geiger and others participated.

V. E. Chaney then gave an explanation of the handbook interpreting the plant accounts and Mr. Cragg explained the plant handbook and outlined the method of use. Following these was a general discussion on various topics of interest to the meeting and a number of suggestions for future work by the committee.

Plant Division Conference

The plant division conference held its luncheon and meeting in the Bal Tabarin room of the hotel under the leadership of A. L. Stadermann, chairman of the division. The first topic was pole line costs, which was led by R. V. Achatz of Aurora, Ind., who showed costs for a particular group of 16 poles. A rough estimate of cost per pole was $6.20, but when other items of actual cost were included it was found that the cost was $8.22 per pole including material and cost of delivering and placing in the line with labor including the gang foreman. No allowance for departmental or general overhead or engineering were included. This was followed by a discussion of costs and methods of reckoning costs. Mr. Stadermann suggested a plan of determining cost of poles by weight. Other topics were then brought up and discussed to some length, among them being maximum sizes for aerial cable; use of concrete with underground conduit and economy of copper and iron wire. Among the men who took part in the discussions and contributed freely of their experience were O. A. Knell of Saint Paul, Minn., H. B. Crandall of Springfield, Ill., F. H. Runkle of Portage, Wis., Will Green of Abilene, Kas., Max Hosea of Indianapolis, Ind., George H. Eck of Park Ridge, Ill., M. V. Wright of Erie, Pa., and others.

Traffic Conference

About 35 managers, traffic men and chief operators attended the luncheon and conference of the traffic division. Sam H. Shutt of Waco, Tex., read an interesting paper on "How Better Operating Methods Pay." Mr. Shutt pointed out the waste that occurs from inefficient operating methods and indicated how this might be avoided by better instruction of operators and better supervision

(*Continued on page* 31.)

Anno

The Formation o

AMERICAN ELECT

Having Extensive Facilities for Manufactu
Equipment, Telephone and Electrical Sup
the Monarch Telephone Manufacturing

American Electric Company, Inc., a new corporation with general offices and factory at State and 64th Streets, Chicago, has taken over the complete lines of manual telephone equipment, and telephone and electrical supplies formerly manufactured and sold by the Monarch Telephone Manufacturing Co. of Chicago. The new corporation has, in addition, purchased the assets, goodwill and business of the former American Electric Company and will carry on the manufacture and marketing of its entire line of telephone, radio and associated products.

The new company's engineering and production facilities, already extensive, will be enlarged to meet the needs of a growing business, and with its comprehensive lines of manual telephone apparatus, telephone supply material and radio products, the company is in a position to meet the needs of the telephone field with an unusual degree of promptness and efficiency. Customers of the former American Electric Company and of the former Monarch Telephone Manufacturing Co., in addition to being able to secure equipment formerly manufactured by these companies, will enjoy the advantages that come with better production facilities and enlarged resources.

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W. F. Benoist - First Vice-Presid
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(*Continued from page 27.*)

of circuits. W. I. Howard, traffic superintendent of the Tri-State Tel. & Tel. Co., Saint Paul, then read a paper on "Central Office Management," discussing in detail the effect of arrangement of equipment, scheduling of operating force and relations of the supervisory force. The final paper was on "Analysis of Operator's Work Time," by R. F. Pagels of Warren, Ohio, in which was given a study of the work units necessary in performing the various operations and the scheduling of force to handle the traffic. A general discussion of traffic matters followed which gave those in attendance an opportunity to present their individual problems.

Thursday Morning Session

At the Thursday morning session the platform was graced by the appearance of P. C. Holdogel, Frank H. Woods, Judge N. C. Hunter, C. Y. McVey and G. W. Robinson, all ex-presidents of the National Association, and Frank L. Beam, who had attended the first convention of the Independent industry thirty years ago. The chairman of the nomination committee, P. C. Holdogel, then announced that the committee was ready to report and that it has found that there was agreement in the committee that the eleven retiring directors be re-elected. No other nominations were made from the floor and the election of the retiring directors was made unanimous. C. B. Cheadle called attention to the illness of Manford W. Savage of Champaign, Ill., a former president of the association, and a committee was appointed to send a telegram to the family expressing hope that he might have a speedy recovery. However, Mr. Savage's illness proved fatal, as is recorded elsewhere in these columns.

The first paper of the program was given by Thorne A. Browne, a former member and chairman of the Nebraska Railway Commission, on the subject, "Commission Approval of Public Utility Securities." This paper, abstracted, appears in this issue.

Following Mr. Browne, President MacKinnon announced that illness had prevented the attendance of David F. Houston, president of the Bell Telephone Securities Company of New York, who was to have delivered an address on Telephone Financing. He then began to enumerate a list of substitutes who had been obtained only to end with the announcement that all of these men were present in the person of one man, Mr. B. E. Sunny, chairman of the board of directors of the Illinois Bell Telephone Co. and a director in many other large enterprises in the middle west. Mr. Sunny's address given from scant notes was in his best vein and his reference to relations between Bell and Independent companies and his keen insight into the problems of the business made a hit of the convention. A summary of Mr. Sunny's remarks appears in this issue.

Following the session a short business meeting of the Independent Pioneer Telephone Association was held and the meeting adjourned to attend the Pioneers' banquet and entertainment.

Final Session

The final session of the convention on Friday morning was devoted to the subject of Taxation. Alfred L. Geiger of Washington, D. C., general attorney for the association, spoke at some length concerning a study of the tax situation that is being made at the Washington office of the association. One of the things indicated is that the burden of taxation will increase during the next few years unless effective means are found to restrain state and municipal expenditures. Mr. Geiger then discussed the various methods of taxation including the capital stock tax, tax on corporate property, franchise tax, tax on gross business, occupational tax, pole tax, and message tax. He made a strong point of the duty of a telephone company to resist any unfair tax even if the amount involved was small as acceptance of the small burden may later result in a heavier burden being imposed.

The discussion was very active, indicating the interest which telephone men are beginning to take in tax matters. Among those participating were R. V. Achatz of Aurora, Ind.; A. L. Stadermann of Terre Haute, Ind.; Sam Tomlinson of Plymouth, Ind.; J. B. Earle of Waco, Tex.; J. C. Crowley of St. Paul, Minn.; S. L. Osgood of Madison, Wis.; J. W. Holloway of Smithfield, Va.; and Earnest Irwin of Pomona, Cal.

The session finally adjourned and the convention closed at 11:30 a. m., after which many of those present attended a meeting of the Executives Club of Chicago, at which Mr. Ray H. Manson, chief engineer of the Stromberg-Carlson Tel. Mfg. Co., spoke on "The A-B-C of Radio—Present Trends."

*MacKinnon Probes Gold Rush Perils for Independents**

By F. B. MAC KINNON

(**Presidential Address at U. S. I. T. A. Convention*)

The Independent telephone group is stronger today in many ways than it ever was before. It is stronger in the solidity of its membership, in the cooperation between them, and in the results being obtained by the operating forces.

During the year we have been experiencing a very new and, to, us, a very peculiar sensation. For several years, as you, who have attended these conventions, will remember, I have discussed the problems of men and money.

During this last year we have had money showered upon us until we are almost in some places overwhelmed by it; so that the problem of money has been changed from that of a lack of money to a super-abundance of money—although, perhaps, it may be that there is not so much money as credit. We have established our credit and the men, who themselves have credit, have come to us to take advantage of our financial situation.

To some this condition, where outside capital and outside men are coming into our group, into the telephone industry, is a dangerous and alarming situation; to others it appeals as in the end very beneficial. We have, therefore, these two groups whose opinion we must harmonize.

We can harmonize them if those of you who have been in the telephone business these many years and upon whose shoulders rests the responsibility for the conservation and the careful operation of the properties, stop, look and listen and consider well the whole situation, and advise your bankers and those in touch with you to stop, look and listen—to listen to the advice of men who know—to look well into the peculiarities of the business and not to make your investment until you have stopped long enough to really consider what the telephone industry really is.

No Speculative Profit

First, I think these men coming from outside should understand that there is no speculative profit in the telephone business. There are men among us who have been operating properties for a term of years who, by the sale of their property, will realize and turn into cash a life's work. That we cannot class as a speculative profit. But to the man who buys those exchanges and pays the present value of them, there is, as we see it, no chance for a speculative profit.

The properties must be made to earn by careful, conservative management; and even with that careful, conservative management, they cannot earn more than what is classed as a reasonable return on the investment. There is, I repeat, no opportunity for speculative profit in the telephone business.

If there is no speculative profit in the telephone business, why is it that so many are turning to the telephone business for a chance of making money?

One reason for that, I think, is this: That there was a chance for speculative

profit, which was realized, in the electric light and power business. By purchasing small lighting plants and merging those plants into one large system, with a central station feeding the power and current, companies have been able to effect economies—to make financial showings—that have enabled their owners to issue large amounts of securities and reap a high speculative profit.

I believe that any group of our people familiar with the operation of the telephone business will advise a group or an individual banker that the investment at present values must be made with the understanding that the very best that can be done is to secure an interest return on that money. J. G. Ihmsen, of New York, said last night, telephone service is rendered at cost.

Into the operation of a telephone property there goes the time and energy of the management and the employes. That management and those employes are recompensed by salaries which go into the cost of operating those properties, into the cost of service. All that is left goes to return and interest on the investment—and that is only a normal interest, the cost of getting the money.

So we think we are safe in saying to the public—and by that public we mean not only the subscriber with whom we come in contact every day, but the banker and the investing public—that telephone service in this country is rendered at cost, as was so ably suggested by Mr. Ihmsen. The only difficulty is to get all the elements of cost included so that we may be reimbursed for our expenditure.

There being no chance of profit in the industry, what kind of an inducement is offered for the investment of outside money? Only this: That the telephone business is the safest and most even business in this whole country. There is less fluctuation in the return from exchange revenues than there is in the return from any other industry.

How can one organization afford to pay more than another?

The first organization—that is, the investment banking organization—is offering the prices which his engineer tells him the property will appraise, and is doing it on the assumption that, once he secures possession of the property, he can advance the rate or secure advanced rates sufficient to earn a good return on that investment.

There are, of course, some of the investment bankers that we of the association feel are not thoroughly investigating the situation but are grouping properties, perhaps, with the plan of issuing securities rather than with the plan of operation. There are others who are doing so conservatively and thoughtfully and are grouping properties with the plan of operating and making those properties earn, and they purchase knowing that they must return a higher rate in order to secure that earning.

So we have this interesting situation before us as to whether these new elements—new elements to a very large extent—that are coming into our industry are right in their assumption that they can secure rates sufficient to earn on the higher value; or whether the other man, who has had experience in telephone operation—years of experience in the endeavor to secure higher rates—is correct in saying that only a lesser price, a more conservative operation, is necessary to properly conserve the industry.

It seems to me that in this condition it is time for every man who has his money or his life invested in the telephone business, to speak openly and frankly to those who are coming in from outside and are not as familiar with the situation as he.

Prior to this new condition there was a tendency toward consolidation within our group. This was a natural movement and was moving along in an even, natural way. It was regarded as a necessary outcome of the conditions of the industry and that we would see more of the consolidation of the smaller properties into larger units as time went on.

There are those today—and there were then—who considered that that tendency was not the one that should be urged by the Independent organizations but that those organizations should stand on the original principle of the Independent companies—that a company, locally-owned and operated, was the best sort of company for the community and for the investor.

Earning Status Reversed

Conditions have been changing. Conditions in the cost of construction, in the cost of operation, have changed greatly since the war. Prior to the war statistics were shown us that the smaller companies were earning a higher return on their investments than the larger ones. Since the war the condition has been reversed, until today our class A companies—our larger companies—are showing a higher return on the investment than the smaller ones.

The question that enters in there, and one which we should examine very thoroughly before we reach a conclusion is: Is that increased earning of the class A company due to more careful management, to the application of business methods where such methods had not formerly been so applied? Or is it due to the inevitable conditions of the business caused by the higher prices of material, and particularly the higher prices of operators' wage and lineman's wage?

If it be the latter, how has the larger company overcome it? And why is it that the showing today is that the small isolated exchange is not showing the profit that it did prior to the war?

The answer comes to us from some sources: That the small exchange owner and operator has not himself moved forward to meet the situation.

The answer has come to us from Minnesota, for instance, where J. C. Crowley, the secretary, has actively carried on a campaign of education of the managers of smaller properties on the elimination of unnecessary exchanges by those smaller properties, and has put numbers of them on their feet financially by introducing to them real business methods.

We have 9,000 companies in the Independent group. Of these, only 200 are in the A, B, and C classes; that is, only 200 have gross revenue of over $50,000 a year. Many of the 9,000 small companies are so small that we cannot classify them as companies; they are individual ownership, of some of them almost orphans.

It is this class of companies that in some states it has been necessary for some outside influence—not for investment purposes, not for personal profit, but through the association organization—to come in and take those properties and put them in a larger organization, eliminating the unnecessary duplication of exchanges too close to one another and bringing into the organization the management which the most of them lacked.

Small Companies' Hope

Now the question is: Under the present movement will the outside influence that is coming in—this investing influence—in any way modify the situation as to the smaller company?

My own opinion is that it will not. My own opinion is that any group of investors that attempt to build a property upon these small units entirely will not be successful in carrying out their purposes; that the proper solution of the problem of the very small exchange is that which must come from within the industry; by men in the industry simply putting management into the property, after a careful survey of the particular neighborhood or locality.

There is no reason why some of these new organizations should not profit and be successful and make good on their security issues, if they are following along proper lines in their purchase, in their organization and in their operating of affairs.

Conservation of Man-Power

We have an overabundance, as I said, of money, credit, but we have not an overabundance of men, and the supply that we do have must be carefully conserved. Nothing should be done to disturb our men and women in their desire to continue in the business, in their ability to move forward and realize their life's ambitions. Anything that disturbs the industry in that way is going to create a very serious condition.

We, therefore, have a condition that may be fraught with danger to us. If those financing operations are carried for-

However storms may interfere with travel, telephone operators are at their posts

An Unfailing Service

AMERICANS rely upon quick communication and prove it by using the telephone seventy million times every twenty-four hours. In each case some one person of a hundred million has been called for by some other person and connected with him by means of telephone wires.

So commonly used is the telephone that it has come to be taken for granted. Like the air they breathe, people do not think of it except when in rare instances they feel the lack of it.

Imagine the seventeen million American telephones dumb, and the wires dead. Many of the every-day activities would be paralyzed. Mails, telegraphs and every means of communication and transportation would be overburdened. The streets and elevators would be crowded with messengers. Newspaper men, doctors, policemen, firemen and business men would find themselves facing conditions more difficult than those of fifty years ago, before the telephone had been invented.

To prevent such a catastrophe is the daily work of three hundred thousand telephone men and women. To maintain an uninterrupted and dependable telephone service is the purpose of the Bell System, and to that purpose all its energy and resources are devoted.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

BELL SYSTEM

IN ITS SEMI-CENTENNIAL YEAR THE BELL SYSTEM LOOKS FORWARD TO CONTINUED PROGRESS IN TELEPHONE COMMUNICATION

ward inadvisedly, if the securities are overissued and the properties are not able to earn on those securities, those properties must necessarily fail; and the reaction may be bad for the Independent group and the whole telephone industry. That is the danger element.

On the other hand, we have in this movement—as has been pointed out by a number of our state organization men—an element of assistance and help. Men for the first time are realizing the value of their properties when they or their neighbors are offered what seems to them a high price.

After an appraisal by a competent, well-recognized engineer, those men and those neighbors begin to realize that they have something there that they did not know about—and this whole movement has increased the value of telephone property in the minds of the owners as well as in the minds of the investing public. This is what has been done by the movement that is good for us.

If also a new element enters in, which is determined through proper channels, to secure adequate rates, that is going to be a benefit to a great many of the neighboring companies by showing by example what can be done. If some of these newcomers, as we may call them, rebuild their properties, put them on a better operative basis, that is going to be a beneficial influence.

That which we must guard against is the entering into our industry of what we have not had heretofore—the speculative element. We went through that period, which started some 30 years ago and over, of competition with the Bell organization; we have just come through the other period of elimination of duplication through working out those duplicate situations with the Bell company; and now we stand in a position where our industry is being stirred by this new influence—the influence of offered investment from the outside. The new influence can be made to be of real benefit to us, or if it is not guarded, it will be a danger.

Danger in Statements

One of the dangerous points that we noticed in financial statements that were issued by some of the houses, perhaps a general practice, was that net revenue is given prior to depreciation. Now in the telephone business, depreciation is somewhat of a known quantity, as is also maintenance. The first inquiry the man experienced in the telephone business makes about the company is: "Are they setting up an adequate depreciation? Are they providing for that in their reserve?"

The depreciation should be in the operating expense, and so clearly stated. It should be stated as a part of expense, so that when the statement is read it will show definitely that all expense, taxes, depreciation—all necessary rent deductions, etc.—have entered in as an operative expense, and the balance shown is the real balance available to pay interest and dividends.

It would seem to me that the investment houses offering securities should come out and plainly make their circulars show the real situation, and not make it necessary for the prospective buyer to consult someone else who will analyze that situation and point out wherein the circular has failed to state the facts plainly. That in itself is a very bad thing to have happen, even if the analysis results in a favorable answer.

We also call attention in our circular to the fact that maintenance is a known quantity and that in examining a financial statement the inquirer will look to see how much is being spent for maintenance. It is fairly easy to ascertain whether it is a correct quantity, because experience over the term of years has shown that the maintenance expenditure about equals the depreciation set up year by year, if that depreciation rate is adequate. The adequacy of it can be easily figured as judged by the rate commissions that have granted, depending upon the type of construction of the property, from 5 to 7 per cent.

We have made our annual analysis of the operation of our A, B and C class companies, and we found this year that the B companies operated during 1925 on 79 per cent of their gross. We found that the A companies operated for 74 per cent of their gross; and the C companies for something around 80 per cent of their gross. Those figures are taken from the reports of the companies to the Interstate Commerce Commission.

Therefore, we have said in our circular that when the operating ratio is shown down low—50 or 55 per cent—careful scrutiny should be made of the statement, because some elements of expense must have been omitted. The 200 A, B and C class companies, for which we have the statistics, are operating, and have been operating successfully, each one independent of the other, over a period of ten years. When we put those individual operations together and they show an even running of the ratio between 75 to 80 per cent, we feel that we are fairly safe in saying this about the percentage that a well-operated property should show.

Independents Prosperous

I am very glad to be able to report to you that the Independent group during 1925 continued to show prosperous earnings. I feel that, perhaps, in a way the association is responsible for the attention that is being given to our group by the bankers, because for two years now we have submitted the results of the operations of our companies, and those operations have shown wonderful earnings on the investment which have naturally attracted attention.

In 1925, our A class companies earned 6.6 per cent on investment in fixed capital. I remember, some two or three years ago, in discussing the situation, that the earning of the A class companies was 5.2 per cent and I urged the operators of those companies to secure rates and adopt methods which would increase their earnings just a fraction—2/10ths of 1 per cent—and bring them up to the level of the general Bell earnings throughout the country.

We have exceeded that. The earning of our A class companies last year was 6.6 per cent on the investment in fixed capital, a higher rate than is shown by the Bell companies as a group on their investment in fixed capital.

The B companies showed a return of 5.6 per cent and the C companies a return of 5.4 per cent.

I wish it were possible for us to submit to you the report of the earnings of the 9,000 D companies—but that is impractical—because it would be interesting to know whether those companies are following on down this decreasing scale of earnings as is shown from the large companies down to the C companies. Before the war that condition was reversed, the C company was showing a higher return than the A; but year by year the A company has been climbing up and the C company has been declining; in other words, the smaller company has not kept up on its earnings.

The A companies in 1925 earned 9.7 per cent net on their capital stock, after paying all interest charges; the B companies earned 8.9 per cent and the C companies 5.4 per cent.

A man who is considering the operation or the creating of C companies or smaller, should very carefully consider this situation; should go into it as to the whys and the wherefores, and see what is going to have to be done in order to bring those smaller companies up to the earnings of the larger group.

A Companies Lead

The A companies in 1925 gained 7.1 per cent in their subscribers, the B companies 3.4 per cent and the C companies 1.5 per cent. These figures are somewhat significant. The more you study the reports and the more you study conditions, you will find, I think, one condition exists which has not yet been remedied. It is that the rural rates have not been advanced in keeping with the city rates.

Many of these larger companies are operating such exchanges and have secured rate advances which have enabled them to keep up and show these earnings, but the C class companies and the smaller companies have not kept up in their rural rate. That is one of the problems that the management of consolidated properties made up of C and B class company exchanges is confronted with from the very start—and they must solve it, although we, as an industry, must solve it ourselves in our situation.

Multi-Million Dollar Pole Merger Is Effected

Minneapolis, Minn.—Expansion of the Backus-Brooks and Pendleton-Gilkey interests to include the National Pole Co., and the formation of a new amalgamated company with assets between five and six million dollars has just been announced by H. S. Gilkey, chairman of the board of directors of the new company.

The new organization will be known as the National Pole and Treating Co., with headquarters in Minneapolis and will take rank as the largest producer of cedar poles in the country. The amalgamation includes by purchase from the J. C. Kirkpatrick estate of Escanaba, Mich., the assets and business of the National Pole Co., the American Cedar Co. and Northern Tie & Treating Co. of Minneapolis.

The directors of the new company, which has been organized under the laws of Delaware, are as follows: E. E. Backus, Seymour W. Backus, Wm. F. Brooks, F. R. Pendleton and H. S. Gilkey. The officers are H. S. Gilkey, chairman of the board; Seymour W. Backus, president; G. H. Ramsey, L. A. Furlong and F. G. Moore, vice-president, and Wm. F. Brooks, secretary and treasurer.

Vice-President Ramsay, formerly assistant to President Allen Bole of the National Pole Co., will have charge of the pole department; Vice-President Furlong will continue in charge of the post and tie departments, and Vice-President Moore will continue in charge of operating the yards and treating plants of the company. The above parties, together with John Junell, F. B. Thompson, C. B. Nield and C. Hertel comprise the stockholders of the new company.

For many years the National Pole Co. has been the largest single producer of cedar poles in the world. The American Cedar Co. and Northern Tie & Treating Co. have also been for many years large producers of poles, posts and railroad ties and in conjunction therewith have operated extensive treating plants.

The new company just formed will have supply yards located at strategic points. It has treating plants at Minnesota Transfer and at Everett and Spokane, Wash. The first named is said to be one of the largest and most complete wood preserving plants in the world, treating poles, posts, ties and lumber.

The company will hold a strong position in the distribution of its poles through its sales contract with the Graybar Electric Co. and through its contract with Western Electric Co., which supplies a substantial share of the cedar poles used by the Bell Telephone System throughout the country.

Missouri Plans Annual Meeting at Kansas City

Jefferson City, Mo.—Arrangements for the annual convention of the Missouri Telephone Association, to be held at the Hotel President at Kansas City, Mo., November 17 and 18, are practically completed. Never before in the history of the association have the indications pointed to as successful convention as this year, says an official statement.

As an indication of the interest being taken in the meeting, the association has already secured reservations from sixteen exhibitors, some of them taking two large rooms.

The program is being arranged so that the telephone business will be presented both from the viewpoint of the man engaged in it, and from the viewpoint of the man whose only connection with the industry is that of user of the service.

A valuable feature of the convention will be the Operators' School and Conference. This will be conducted by two women who stand out pre-eminent in this department of the business.

At 6:45 o'clock p. m., November 17, the banquet will be held in the Congress Room of the hotel. Immediately following the banquet, in the same room, will be presented the Pageant "Fifty Years of Progress." This pageant will be produced by employes of the Southwestern Bell Telephone Company from the State of Texas. The Southwestern Bell Telephone Company, at the solicitation of the Association, has agreed to bring this pageant to the meeting. Following the production of the pageant, the room will be cleared and those who care to may dance.

Reservations may be made by writing direct to E. A. Cleary, manager of the Hotel President, Kansas City. It would be well to make reservations at once as the American Royal Stock Show is in Kansas City the same week and there will be a number of out of town visitors in attendance.

WANTED

One copy each of TELEPHONE ENGINEER for January, February and March, 1926. Will add two months to your present subscription for each of said copies. Address TELEPHONE ENGINEER, 225 North Michigan Avenue, Chicago.

Hubbard Introduces New Peirce Safe Platform

Pittsburgh, Pa.—Hubbard and Co., makers of Pierce specialties for electrical distribution requirements, and of Hubbard line hardware, have brought out greatly needed new device in the Peirce Lineman's Safety Platform. The makers of the Peirce platform state that with it a lineman can always place himself in the proper position to do his work, with saving in time and effort, and in safety.

The platform is made of airplane spruce, specially selected and cured. The platform is treated with an insulating and waterproofing compound which also

Peirce's New Safety Platform

acts as a wood preservative and does not allow the platform to become slippery when wet. The platform is held to the pole by a high grade metal frame which has spears that firmly dig into the pole, and a chain arrangement. Each platform is given a 600 pound mechanical test, 12 inches from the far end, before shipment.

Further details of the new Peirce linemen's safety platform will be sent to any interested telephone man by Hubbard and Co. headquarters at Pittsburgh, or any of its branch offices.

Canadian Independent Meet at Toronto, Nov. 17 and 18

Toronto, Ont.—An interesting program has been scheduled for the annual convention of the Canadian Independent Telephone Association which is to be held at the Hotel Carls-Rite here, November 17-18. Many of the leaders of the Industry in Canada and the U. S. are slated for addresses. The supply men will tender the convention attendants a big banquet.

Picture of Public Regulation of Securities Is Shown

By THORNE A. BROWNE

I need not dwell on the early history of independent telephone companies. I need not recall to your minds how companies were promoted to compete with Bell subsidiaries all over the country; how local capital was put into small plants in thousands of communities; how these properties were usually constructed with rigid, too rigid, economy, resulting generally in very little surplus capitalization; how under the influence of spell-binders they put into effect wholly inadequate rates upon the supposition that their plants would never wear out; how they put all their early earnings into plant extensions rather than to invest additional capital; how these early investors went without dividends year after year falsely proud that they were doing their part in throttling the octopus; and how the capital became so thin over the property that it was thread-bare.

There was presented then and even today the spectacle among the smaller independent plants of large and undoubted surpluses. Book values far above par and total paralysis of credit. Local banks loaning only limited amounts dependent on their faith in the manager. Stockholders getting no further kick out of fighting the "trust," looking upon their certificates as scraps of paper and refusing to donate any more to the alleged charitable enterprise. Perfectly sound properties with actual records of net earnings, but with such a dividend record over so long a period that they were discredited both abroad and at home.

Many of the larger independents with representation here today were built on the ruins of these misdirected ventures. Stockholders discouraged, no capital available, plants wearing out, replacement funds frozen in property extensions, the properties were sold at heavy discounts either to the Bell organization or to those with ability to operate in a business manner. Some other of the independents of note were pioneered by hard-headed business men who avoided the pitfalls, and who look back now upon their still youthful industry with proud regard for its financial history.

Lauds Bell Financing

Perhaps this enviable record was due to the men who engaged in the business. Perhaps the real promoter was never tempted to try his skill here, but confined his attention to other businesses, private and quasi-public. I apprehend, however, that the example of the great Bell corporation had its influence, consciously or otherwise. Its teachings were worth following. I want to take this occasion to say that in my opinion the financial history of the American Telephone & Telegraph Co., and of its subsidiaries since they have been so classed, stands out clearly and cleanly, unique among the great public corporations of the nation in that at no time were questionable banking houses given chance to loose an unrestrained quest for easy gold. I do not know of any of the larger independent telephone companies who need blush over any period of their financial histories. Those banners may now be nailed up for public gaze where some other industries now being carefully and conservatively managed do not want to unfurl the whole flag. Witness early railroad financing as compared with present cautious and clean issues.

Merger Era Here

This is an era of consolidations and mergers. The telephone industry presents a fruitful field. The days are about gone when any kind of business management, or no management at all, can hope to continue either in the telephone field or anywhere else. The public is demanding a superior service which can best be given by larger concerns. Such consolidations can be along sound lines. Elimination of duplicate supervision, duplicate management, and top-heavy maintenance labor will bring substantial reward to those putting their money into these mergers in the way of increased net earnings. Fortunate indeed the industry will be if it can avoid those skillful but rapacious financial manipulators who are not to be content with moderate rewards for skill and enterprise, but who would make their killing quick and then retire, regardless of the ultimate results to the industry.

These consolidations by purchase and by merger can, and I hope will, be upon proper valuations minus the imaginings of engineers competing with each other on seeing the most elements of value, and the highest totals upon which to rest their property accounts. Mere size is not wrong; indeed, we are coming to see that in the public service at least size makes for efficiency and economy of service. It brings to management that high degree of skill that can only be secured where the business is large enough to pay the fare, and the public gains as well as the investor.

That principle of government announced and supported for more than a century by a great body of the people of this nation, that "government is best which governs least" is being crushed under the weight of experience with the complexities of modern civilization. Government is slowly crowding back the individual, and more and more personal rights are surrendered for the good of society. This interference of government will continue, must continue, whether as individuals we like it or not.

More and more the state is undertaking to invade hitherto strictly corporate functions and to speak out with decision regarding methods and extent of financing. Such supervision, over both private and public corporations, applies in many of the states, but by no means all of them. The federal government has laid its restraining hand on railroad securities, and checks each move with, to the railroads, painful particularity.

The purpose of this interference is apparently twofold—first, to keep down the level of rates by holding down the quantity of securities, and, second, to safeguard as well as possible the inexperienced and therefore incompetent investor in securities.

"Water's" Safeguard

It is surprising how the public clings to the idea that an excess of capitalization, familiarly known as watered stock, increases the tariff on public service. It has been the really big inducement for enactment of such laws. At best, of course, the effect on rates can be only indirect, but on service it may be very real.

As time goes on regulation of securities issues becomes more the paternalistic effort to protect the innocent against his own rash acts. It is in this field that the regulator must spend his time. It may be unfortunate that any restraint should be necessary, but government is for the purpose of protecting the weak from the strong and the rule applies in this domain as well as in that of brute force. Securities are offered to the public. It constitutes in the long run the only market. The average investor cannot know whether the industry is trying to give him something above reproach. He cannot read a financial statement, and if he could he cannot be sure that what he reads there represents the reflection of the whole truth. So the state steps in to supervise, and to prescribe penalties for

violation of reasonable directions of public authority.

A considerable experience forces the conclusion that supervision is essential. There is enough manipulation among public service corporations to put all of them under scrutiny, and you who have proud records of conservative action must suffer the delays, the irritating exactions and the restrictive hand of public authority because of "get rich quick" policies of a few.

Accounting practices should always be above criticism. Any public service corporation following careful and approved principles of property accounting will have no trouble to prove its way in finance matters. Consolidations and mergers recorded under the rules of accounting, approved by the National Association of Railway and Utilities Commissions, or under the very complete set of rules of the American Telephone and Telegraph Co., or under the accounting principles set forth by the National Electric Light Association, will raise no question as to the resulting financial structure. The difficulty, at least from the regulator's point of view, is that too often these sound principles are not followed and these departures are to be found usually among concerns most vigorously pushing sales of securities to the public.

Accounts Above Criticism

Books of accounting are essential records. These should show cost and if they do not they lack the fundamental reason for existence. In perfecting reorganizations, consolidations and mergers, too often these essential records are ignored or destroyed. New property accounts are framed for the new corporations and these new plant accounts are set up upon assumptions of value. Now value is a very vital thing, but value is neither more nor less because books are altered. It is not uncommon also to bury in these plant accounts intangibles of various kinds, spreading the increases among the classifications and subjecting the plant figures still further to attack and criticism.

Public authorities charged with supervision duty are interested in these departures from sound accounting. There is always reason for changing plant accounts from cost to value. There is a reason why some utilities write off suspense accounts which should be eliminated gradually as charges against operating result. There is a reason for neglecting to provide for property retirements in an adequate manner. The answer is that a utility following such practices desires to make a better operating showing and this better operating showing is almost entirely for the purpose of influencing the market for its securities. Misleading investors should never be charged against utility companies. If the regulatory body cannot correct such situations, it would be better that there were no regulation at all.

In a nut shell if public authority can secure adherence to sound and constructive rules of accounting for the property accounts it need have no concern over the totals of securities that may be issued. Proper supervision of assets accounts is of more value than supervision of securities issues, excepting of course the relation of stocks and bonds in a financial scheme.

I am frank to say that I do not think the public has been particularly successful in its effort to prevent unsound financing, although its influence in the public utilities field has been more valuable than in the industrial field. But, however much the public may desire to do so, it cannot manage private property and the property of public utilities corporations is privately owned. This is a wise conclusion. The capacity of public officials is such that supervision should be kept to most general principles. Courts are, however, inclined to give the public wider scope on questions of securities than on questions of rates. Property values are not affected by the quantity of securities representing them.

Regulation is largely by states. Most state laws seek only to supervise the financing of utilities doing business within the jurisdiction. A few attempt to put check straps upon holding companies which merely direct through stock control the affairs of operating companies within the jurisdiction. The power of the state to interfere widely with the internal affairs of foreign corporation securities even when operating within the jurisdiction is questionable. As to the actions of holding companies owning no property within the jurisdiction and desiring to sell no securities directly to the people of the state the authority is more doubtful. Generally speaking, these doubtful legal points are not tested. The conservative corporation does not desire to cast a doubt upon its proposed new financing by getting into a legal conflict with public authorities. The corporation following unsound methods is even more reluctant to have it known that it is in conflict with the state authorities. Hence the utilities make the most of the situation.

I have some sympathy with the utilities, particularly those which operate as one corporation in more than one state. There is no uniformity of law, and less uniformity of procedure. To meet the requirements of official bodies in several states is sometimes impossible because they are contradictory. Time will come when uniformity will exist. Much thought has been given to this subject by the American Bar Association and the National Association of Railway and Utilities Commissions and considerable progress has been made. I apprehend that within a few years this irritating situation will be relieved.

The tendency to consolidate into large property within one corporation, such property extending into several states is rapidly making the problem of supervision more difficult.

A corporation with property in Texas, Oklahoma, Kansas and Nebraska submits to the commission of Nebraska proposed financing for purchases in Texas. Or several railroads desire to underwrite construction of a union station at St. Paul. It must be obvious that the regulatory commission in either of such instances can check such proposals only in a general way. Quantities of property and advisability of purchases must be corporate matters and the scrutiny must be confined to the general plan of the proposed financing and the soundness of accounting practices. Even supervision of accounting practices of a corporation whose offices are in a distant state can be only superficial unless there is a policy of mutual effort on the part of the state and the corporation to work in harmony. That harmony exists usually. Now and then a maverick management disturbs the whole industry and gives the regulatory commission much trouble. I am not speaking of your industry particularly, but of the general situation. There is much less of this in the telephone industry than in industries in general.

I presume no paper from the regulator's point of view would appear to him quite complete unless it sounds a note of alarm. Since the great war the tendency in the public utilities field as well as in the industrial field has been rapid and large consolidations. Sometimes these are by purchase and absorption one by the other, sometimes by merger, and sometimes by complete reorganizations. This tendency to date is least noticed in the telephone industry. The field, however, exists and doubtless will be entered. I think the industry can look forward to more activity of this kind in the next five years than in the past five years. Some of this activity is brought about not so much from economic advisibility or necessity as from desire of investment houses to offer securities in a ready market into profit from the flotation. A usual plan is to purchase adjacent or even isolated property, dissolve the separate corporations and provide a new corporate vehicle. The cost of property to the disappearing corporations is ignored and a starting point is set which may be conservative or be based upon a forecast of the future pregnant with hope. Usually the property accounts are greatly extended and large intangible elements are introduced. First mortgage bonds may be allowed to continue as underlying or refunding bonds may be offered on the consolidated properties and the underlying bonds be retired. These first mort-

gage bonds on the operating properties are of course in the hands of the public. Usually some preferred stock may also be in the hands of the public.

In the most objectionable plan common stock makes its appearance against the intangible values inserted into the assets, and this common stock is lodged in the hands of a holding company introduced into the scheme for that purpose. This holding company usually has other securities than the common stock which is backed by an earning power only. To gain the funds with which to purchase, it in turn sells to the public collateral trust bonds, or debenture bonds, or preferred stock, or all of them. It also introduces a factor of common stock with sole voting power. This may or may not represent some investment of dollars. Sometimes it does not. There may be other holding companies in the string, following out the general plan here outlined. Sooner or later the voting or controlling stock is, in this extreme but not uncommon case, in the hands of men who pay nothing for it except the use of keen minds.

In this manner a large number of valuable operating properties may be centralized. This presents both elements of strength and weakness. Strength in that it offers keener operating management, economic buying power, and uniform practices. Weakness in that the temptation for financial manipulation is great.

I cannot leave this phase of the subject without mentioning a far too common present tendency. Some organizers and their banking connections are not content with the profits from issuing and marketing of securities based alone on present or anticipated excess earning capacity. They organize engineering and construction companies to which contracts of subsidiaries are let without a free meeting of minds. They produce excessive construction costs. They have management, insurance, and purchasing corporations, and even their own bond houses. In fifty years Union Pacific did not recover from public disfavor because of Credit Mobilier, nor Rock Island from the manipulation of the Moore interests. Those things are being done again outside of railroad corporations. Will the telephone industry remain free of the maelstrom? The public supervisor will do his part to the extent it is within his power.

I do not want to be understood as condemning as of dishonest purpose all such subsidiary and inter-related machinery. Some of it, much of it, is scrupulously handled both to the gain of the operating subsidiary, to the rate paying public, and to the investor. It is simply fraught with grave danger and offers as tempting an apple—almost—as caused the fall of Eve.

Regulation has been almost powerless to curb the tendency because of diverse citizenship. Usually all the interlocking or inter-related corporations are domiciled remotely, preferably in Delaware. I do not know that the state should attempt to forbid consolidations and mergers. At all events it could hardly prevent common ownership of stock, and the mischief, where mischief occurs, is done in the handling of this stock.

It may be asked why be disturbed by the tendency? So far as rates are affected the state need be little concerned, provided rate regulation is effective. But it is again in the paternalistic field that the concern lies. The farther away from the physical properties the securities lie in the financial fabric the less desirable they are for small investors. As to stock, it is true these rather remote issues are often quoted at attractive prices. This fact does not, to me, detract from the criticism. All holding company securities are speculative as distinguished from investments. I know of no way public authority can fully control the tendency except by federal enactment. Blue sky laws may protect the investor in a way, but the larger concerns are likely to fall within exception classes, which cannot well be omitted from legislative scheme. But size of a corporation is no insurance of sound securities.

The problem belongs to you as well as to the state. The state can go no further in its action than to say the plan is fairly conservative and honest and that the proposal issues are necessary for corporate purposes. Unfortunately part of the investing public takes this as a recommendation of the investment. Nothing the public authority can say will prevent that. If the plan is unsound, approval can be withheld as to some. As to others regulation is practically impotent. The utility that puts out issues which become "sour" not alone suffers in its credit. The unfortunate result of greed, unrestrained optimism, or unforeseen disaster reacts against all securities of the class. If the public utility commission has approved, it is condemned. It is likely to be condemned anyway. The investor and all his friends lose confidence in the integrity of the industry's management. You may have guarded your own securities with the jealous care of Caesar towards his wife's honor. One irresponsible issue put out by a shady investment house gets past your guard in spite of you.

Home Guard of Profits

Most of you endorse the wisdom of customer ownership at least to a limited extent. Given similar market conditions it is wise to sell your securities at home. Careless critic becomes careful student. You have friends when you need them. This friendly spirit can only be maintained where confidence exists, where on the whole you can provide a secondary market, and where your financial rating is not jeopardized. A "sour" issue ruins that desirable relationship between customer and company and renders restless small investors in other similar securities. Public relations may well become worse than were no customer ownership attempted.

What can you do? I can cry with alarm more readily than I can point the remedy. It appears to me to be large enough a problem to call for the best efforts of regulatory bodies and conservative management, working towards a common end. Happily the conservative operators outnumber the rash.

The future of the telephone industry is rosy. You have the only natural monopoly in the public utility field. Never again, with even ordinary prudence, will competition seriously threaten. Duplication is intolerable from the service point of view. Rates do not approach what the traffic will bear or what the service is worth, save in individual instances. To date financial histories are unusually clean and management of high order of integrity exists.

Public relations were never better or confidence wider. You can look upon your handiwork as Jehovah did at the end of the sixth day and say with him "It is good."

Frank Eldridge Resigns from French Battery

Chicago, Ill.—Frank Eldridge, who is one of the best known salesmen in the equipment and supply end of the telephone business, resigned from the French Battery Co. Oct. 15, and has become interested in the jewelry business of Eldridge Brothers with headquarters in the Stevens Building, 17 North State street, Chicago.

The Eldridge Brothers organization is primarily a wholesale jewelry supply house, but the response to a letter from Frank announcing his change to many of his friends in the industry, has been such that a good sized retail business has developed speedily. The company handles jewelry, watches and the better grade of advertising specialties.

With a 24-year connection with the telephone industry behind him and hundreds of valuable personal contacts, it is not thought likely that Eldridge will relinquish his connection with the telephone industry, and it is highly probable that in the near future an announcement of a new connection made by him with some manufacturing company in the industry or as a manufacturer's agent, will be broadcast.

Kadoka, N. D.—Dakota Public Service Co., a McGraw interest, has bought the local telephone plant from Neal Rounds.

LINE AND DESK

EARTH BORER GETS RESULTS

Some of the results obtained by use of the tractor type of earth boring machine are described by R. Carter in the following excerpt from an article in "Long Lines":

"I received this machine while on the repair job of the Chicago-St. Louis line break in the spring of 1925. The frost was then from twelve to fourteen inches deep and it was a real job to bore it out by hand. We hoisted the tower and got King Grunt ready for operation, backed under the line and proceeded to dig a hole.

"The minute we perceived how rapidly it spun through the frost, pulled ahead, hoisted the pole and dropped it in a sufficient depth, we looked at one another and began to smile. Voices came from different members of the gang. 'The man who doped out that whoozis ought to have a prize,' was every one's enthusiastic opinion.

"We had been removing creosoted poles with a patent jack, an operation which required approximately forty minutes. King Grunt backed up and pulled the pole in practically a minute's time and then drove away with it hanging like a spare tire on a peddler's wagon.

"There isn't any doubt in my mind that this addition to the force is a great time saver and a wonderful machine. Occasionally we have to lay it up for minor repairs. However, when we do, we look at one another and say, 'Boys, it went haywire.' That means early to bed, for tomorrow we have to go back to the old man power methods.

"Before I knew better, I made the assertion that I could take twenty-five men, dig and set as many poles as one of these machines would in a given space of time. But I wasn't averaging three-quarters of a mile a day (fifteen poles) that way, whereas King Grunt will, with fair going, set fifty poles a day and do it with ease. If there were no ditches along the line and the digger could have an even break, it would set seventy-five poles easily.

"What I mean by an even break is when we don't have to use the plank, adjust the tower, dig out to level up, and we can drive astraddle of the pole line. When we have to back up to the poles, it hurries us to make forty a day. Nevertheless, during these hot days King Grunt brings a smile to the face of every man in the gang."

STORAGE BATTERIES FOR SWITCHBOARD TRANSMITTER CURRENT SUPPLY

We have the following comment from an Iowa subscriber in connection with the use of storage batteries for switchboard transmitter current supply:

"I see where a subscriber is asking about using storage batteries on a magneto board. We are using a six-volt radio storage battery with a resistance in series, cutting it into four volts. We charge this with a Balkite trickle charger, leaving it on all the time. The upkeep is less than dry cells. The reason we are using the six-volt battery is that it costs less than a four-volt here; also the regular trickle charger will work without resistance. We also operate the night alarm from this battery, so we always have a good strong alarm battery."—Glen Smith, Maintenance Man, Farmers Telephone Co.

DO YOU HAVE TOOLS LIKE THIS ON YOUR JOB?

The old wrench had outlived its usefulness. Its jaws were sprung and its handle plates were gone.

The man who used it might receive a painful injury.

Tools in such a condition make an ordinary job difficult.

It is the duty of every employe to report broken tools and defective machinery to his or her immediate supervisor or send a complaint direct to the Safety Committee.—"Cincinnati Telephone Bulletin."

NO NEED FOR SNOWSHOES IN THE PHILIPPINES

I enjoyed E. R. Collins' article, "Toll Line Testing Methods," in July TELEPHONE ENGINEER very much, but had a hard time trying to explain to a Filipino lineman why he should take his snow shoes with him. He maintains that his chineles are enough. We only have snow here in the movies but believe there would be a good market for the real article.

About the chineles: They are one-way shoes worn by the Filipinos and a few Americans that have been here too long. They are not so bad if you go forward all the time, but just try backing up, and you lose them. They are just a sole with a toe cap and one must walk with a dragging effect. They are similar to a well known type of bedroom slippers or sneakers which you get for a Xmas present and then never wear. I find it amusing to see a Filipino trouble shooter come down the street on a bicycle, stop, step out of his chineles and climb a pole in his bare feet, "all same monkey" hook on his test set, chatter a few minutes—and I do not understand a word except "Hello" (they likely do not have a word in Tagalog for that)—take off the test set, come down and step into his chineles, get on the bicycle and ride down the street whistling "Yes, sir, she's my baby."—Ray Blain.

Plug-Polishing Machine Makes Debut in Industry

Kansas City, Mo. — Frazer-Teller-Wakefield, 814 Finance Bldg., have started to get the telephone industry generally to adopt their Premier plug-polishing machine with which the present users have experienced marked success.

The machine is a combination of an electric motor and buffing wheels especially adapted for polishing switchboard plugs. With this polisher it is stated that it takes only three minutes to clean the plugs on a switchboard position where under the old unscientific hand-polishing method, it takes from 20 to 30 minutes to do the same work.

The device is simple to operate and its efficiency and economy is bringing it into the high regard of telephone men. Frazer-Tiller-Wakefield will be glad to give further information about this machine for economical switchboard maintenance, to anyone who writes to them at the address given above.

Salina, Kan.—Southern Kansas Telephone Co. has bought the exchange at Cunningham, Kan.

Huntsville, Mo.—J. O. Kent of Memphis, Mo., has bought the Huntsville Telephone Co.

Mount Pleasant, Ark.—Sale of stock in the new local telephone company has been completed, according to A. J. Younger, president of the Business Men's Association.

New York City—More than 16,000,000 poles are required to carry the Bell's overhead wires. New construction and replacement calls for 600,000 poles annually to satisfy Bell requirements.

Mt. Clare, Neb.—Nuckolls County Independent Telephone Co. has bought the Mt. Clare exchange.

Sunny Says Public Will Pay for Better Service—Commissions Permitting

(Excerpts from the address of B. E. Sunny, Chairman of Board, Illinois Bell Telephone Company, at Independent Convention)

One of the marked things in the history of the telephone, next to the invention of the telephone itself, in my judgment, was the creation of the Independent telephone movement. It came along at a time when it was very much wanted. The Independent telephone movement resulted in the introduction of telephones universally. This could not possibly have been accomplished by the Bell people—even if at that time they believed that the universal application of the telephone was practicable—for the reason that its own financial demands to maintain and expand the plant in the large cities which it owned or had under way just about exhausted all of the credit that it could command.

It is too bad that the beginning of the Independent movement was considered as an antagonistic movement to the Bell, which was the result of competing plants being built here and there. I think the largest part of the work of the Independent was in creating telephone exchanges where none had previously existed. The work of the Independent will stand out always, it seems to me, in the history of the telephone as one of the most progressive and greatest things that were accomplished.

The years have revealed that the Independent companies are no more independent of the Bell than the Bell is independent of the Independent companies. We are both very dependent on each other, if we are to accomplish the very great purpose for which we are here.

In fact, there is very little independence left in business. We are dependent, both of us, on our stockholders, on our subscribers, on the public, on the press, on our employes; on a kind Providence to protect us from the elements—fire, flood and sleet—and finally, for our bread and butter, on the public utilities commissions to give us rates on which we can live.

Mr. MacKinnon told me that the purpose of this meeting was to discuss finances. That is a part of the telephone service which I like to discuss, because I have always been very much interested in the financial side of any business. But it has always seemed to me that the rate, after all, is not the fundamental thing in the telephone business; that service is the very first thing, and that rates are secondary and should be sufficient to support the service.

Politics the Disturber

It has been my observation in Chicago, and I have been here a good many years, that all of the rate controversies which have arisen—whether in connection with telephone, gas, electric light or street car affairs—have had a political basis. The controversy has been started by some man, or some group of men with some political aspirations, and has been carried on a political basis, which means that in most cases there was very little of fairness and very little of truth or justice in it.

As an illustration of that, you are all familiar with the long fight that was conducted in Chicago with reference to the five-cent street-car fare. I was never able to find out that there were many people, outside of some politicians and newspapers, who liked the fight because it made good copy, who were very much interested in a five-cent fare. They were more interested in service than they were in the cost of car rides. I think they rather sympathized with the view that in the war, in the increased prices, the street-car companies ought to have more than five-cent fare.

But you will recall that it was not until the case went into the federal court that the street-car company was able to get eight cents; it subsequently was reduced to seven cents, the present rate of fare, after the war was over and when costs had let down a little. Now the street-car fare in Chicago is seven cents on the surface lines and eight cents on the elevated lines.

As confirming the opinion that the people are not specially interested in five-cent rate, in the past few years we have had 450 busses put on the streets in Chicago. They are carrying about 26,000,000 passengers in a year at ten cents each, and, in the summer season when it is pleasant to ride on top of the busses, they are pretty well crowded. Also the busses in some cases traverse a part of the city where the people are not by any means well off, where, in fact, they are in poorer than moderate circumstances.

It would seem to all of us that they ought to try to save their pennies, but they patronize the bus very willingly and pay ten cents, whereas they could pay seven cents by using the street car. They want service. They are willing to pay for it and there is no difference; they won't consider the difference between ten cents, seven cents or five cents even, if they can get what they want.

I live down on the south side and I frequently go across to the elevated to ride downtown—and I find that there are thousands of young people who ride several blocks across town on street cars and pay seven cents, then change to the elevated and get an express train downtown.

In that way they save about 10 or 12 minutes and have, perhaps, a more comfortable ride, but it costs about 15⅓ cents, whereas they could stay in the street car and ride downtown for seven cents. But they get service; they get the kind of service that they want in that combination of surface line and elevated line—and they are willing to pay for it.

All this, I think, has application on the thing that I have felt all the way through was wrong; that is, the very low rates that have existed for telephone service, especially in the smaller exchanges in the Independent companies.

Mr. Browne has very well explained the genesis of the rate making in the telephone business. It was the work of promoters who went to the investors and represented that the Bell rates were excessive and were producing enormous revenues; that the Independent telephone exchanges could be operated for a lower rate and could in that way get a very much larger number of telephones and be very profitable.

As a matter of fact, at that very time, from my own experience, the Bell rates in the smaller communities were too low for the Bell to get a reasonable profit.

Mr. Fay, who was the general manager of the Chicago Telephone Co. in 1879 to 1888, became very much dissatisfied with the results of the operation of the Aurora, Elgin and Joliet exchanges, where the rates were excessively high in the judgment of some of the promoters of opposition exchanges, and seriously considered selling them out to get rid of them; he did not think they were worthwhile at all. That situation was pretty uniformly the same all over the country.

Hangover of Early Error

It was some years, of course, as Mr. Browne pointed out, before the fact was discovered that the rates in the beginning were too low. But the mistake has been made, and it is everlastingly too bad that in the beginning we did not start out on a higher scale. It is pretty hard to get rates changed after they have once been fixed, as you have all found out; and it seems to me now that our continuous struggle is to get rates raised up to a proper figure.

Of course, the results of these low rates mean that the service is stinted and unsatisfactory, maintenance is neglected, repairs are neglected, and there is a lack of development. The service cannot be what it should be, for the reason that you can't get—you can't hold—the right kind of people as employes.

These low rates are a heavy burden on the industry and they are bearing down heavily on it in every direction. There are a great many fine, well-meaning tele-

phone exchanges which, figuratively speaking, are going about in a shabby, patched suit of clothes and shoes full of holes. The clothes are pressed and kept clean and the shoes are polished, but the poverty of the enterprise cannot be concealed.

Now we ought not to wait with the hope that things are going to be cheaper, that we can employ people at a lower rate, that we can buy merchandise for less than at present. I think that the present range of prices is pretty well fixed; and I think that is somewhat due to the fact that we have become rather blase with reference to prices, that we do not resist increases in prices as we used to. We don't bargain as sharply as we used to; we would rather accept the situation and subscribe to it.

Commissions Harsh on Small

I do not think that the attitude of the utility commissions has ever been exactly fair, especially toward the small telephone systems. I think they have borne down on them pretty heavily. In other to get rates on which they could live at all, they have been put to very large expense for expert, legal, and other kinds of service to make up applications and go before commissions, so that the expense is a very heavy drain on them.

There is a disposition to cheese-paring by some of the commissions that is discouraging and disheartening to the management, to the telephone exchange manager. It is hard for him to get the right kind of a presentation and the right kind of a decision from the commission. He does not get the benefit of the doubt at all. He is on the defensive all the way through, which I think is wrong.

Furthermore, I do not think the amount of money that is invested in a particular town, whether it be on the basis of investment or reproduction value, is the right measure. I do not think it tells you the whole story. I think there ought to be an ascertainment as to the requirements of the telephone business in that particular community.

Equipment Features of Chicago Meeting Set a High Standard

The 1926 Chicago convention exhibits probably eclipsed in interset even those of the many previous successful years.

Addressograph Co. showed its hand- and motor-operated machines, along with stencil plates, filing cabinets and a great variety of forms used by telephone companies: Telephone companies are extensive patrons of this company, and its representative, in charge, D. O. Harrell, has studied the field's requirements carefully.

American Appraisal Co., which specializes in the preparation of physical and financial data for valuations, rate making, or changes of ownership, presents interesting specimen reports. G. A. Callanen, of the Chicago office, had charge.

Automatic Electric Co. took even more than its usual large space to show its line of Strowger equipment, stressing its ability to serve, economically, exchanges smaller than those which hitherto have used its products so satisfactorily. The company's new boards, Types 15 and 18, can be used with magneto telephones, the former being for connector-per-line systems and the latter for lineswitch-connector plants. Another new development, the S-A-M-X, is for semi-automatic magneto exchanges. Strowger automatic switches, through an operator s aid, making connections with ordinary magneto telephones. Type 5 P-A-X and power board, using a rectifier which charges and continuous float basis, also was shown, together with a full line of telephone instruments and several types of monophones. Representatives present included H. L. Harris, executive vice-president; Grant Pelton, vice-president in charge of manufacturing; T. C. Thompson, general superintendent; T. G. Martin, chief engineer; F. L. Baer, assistant chief engineer; W. F. Benoist, treasurer; O. V. Dodge, sales manager; W. H. Walter, R. H. Burfeind, F. J. Truby, Roy Owens, L. A. deBerard, A. F. Combs (Los Angeles), L. A. Cutshall, W. A. Chapin, A. H. VanKoughnet, L. J. Gaddis, J. F. Probst, C. G. Wilson, sales representatives; and H. E. Clapham, advertising manager.

L. M. Berry, of L. M. Berry & Co., was there, as usual, to tell folks that he makes more and better telephone directories than ever, and offer specimens and maps as corroborative evidence. With him were Perry Ballou, sales manager; J. C. Boush in charge of accounts; L. V. Stinson, in charge of compilation; and salesmen R. B. Straughn, R. E. Alexander and J. P. White.

Lynton T. Block & Co., the telephone insurance experts, came from St. Louis to greet old patrons and solicit new ones. In charge of the firm's quarters were Wm. D. Jackson and North Moore, with several from the Chicago office, and L. E. Henderson of their selling staff—formerly exchange manager at Warrensburg, Mo.

F. A. Bowdle showed a line of accounting forms, report sheets, toll tick- etc, etc.—a practical line, devised and published by a practical telephone man.

Carbon Products Co. presented its Victor telephone batteries, supplemented by samples of its radio batteries and flashlights. R. R. MacCracken and I. B. Crissman did the honors.

John W. Coffey—"Jack" in person—was kept talking fast to tell callers about his telephone accounting system; another practical telephone man who knows his groceries.

Copperweld Steel Co., through W. Marshall Page, W. W. Ege and C. J. Spindler, shows that company's popular products which are distributed through the Monarch Telephone Mfg. Co. and leading jobbers.

Cook Electric Co. featured its new X type unprotected terminals of all-steel construction—a good running mate for the S type protected terminal. Also there were the central office protective equipment, lighting arresters, sleeves and test connectors. The company was represented by George R. Folds, president; A. D. Edwards, secretary and treasurer; John F. Jaap, D. C. McKee, E. E. Shields and Chester Ruth.

Dicke Tool Co., makers of construction tools, showed grips for small wire, insulated wire and cable, pay-out reels, tamping bars, pike poles and a rubber tired dinkey. Mr. Dicke and his seven sons presided over the exhibit.

Electric Storage Battery Co. presented its line of storage batteries for telephone companies through M. E. McCall, J. W. Smart, H. F. Schreiber and J. A. Fitts.

Everstick Anchor Co. had "Happy" Crawford there in his happiest vein to demonstrate its line of anchors and its new duplex cable ring and Davis lineman's safety chair. A new tamping bar and the Blackburn cable rings also were shown. H. R. Knelson assisted Mr. Crawford.

French Battery Co. sent Geo. A. Shipley, sales manager, W. H. Conlin and Frank A. Foster, Chicago branch manager, to present its telephone and radio batteries.

C. P. Harrah, head of the Harrah Mfg. Co., exhibited the "Handyman" line of pole pushers, pole pullers and guy stretchers, which have been going big with telephone companies.

Holtzer-Cabot Electric Co., represented by T. G. Meinema and C. L. Calkins, showed charging and ringing motor-generator sets; a constantly improved line which has been standard in the telephone field for over a quarter of a century.

Illinois Electric Co. presented Orangeburg fibre conduit and other construction supplies carried by this firm, which never has missed a national telephone meeting. Glenn C. Merritt was in charge.

Iron Products Co., with C. R. Pieper and C. B. Krueger on the job, exhibited its Drive and Twist (D. & T.) anchors; also its Harpoon anchors. The I. P. Co. has enjoyed a business which taxed its capacity, but recently doubled its manufacturing facilities.

A. J. Johnson looked after the interests of his company in person. "Al." knows 'em all; in fact, sells most of them such well known goods as the American Steel & Wire Co.'s telephone wire, Victor dry cells, Superior friction and rubber tape, pole line hardware and almost every item used in telephone construction work. Aiding him at the meeting were E. Petersen, R. Warnick, W. M. Matthews, O. S. Johnson and A. J. Johnson.

J. K. Johnston, while extremely busy with his work as active head of the Telephone Pioneers, found time to tell many interested callers at his room about the work he has done for scores of telephone companies on appraisals, valuations and rate cases.

Kellogg Switchboard & Supply Co. maintained its eminent position in the industry with a complete exhibit of telephones, switchboards, supplies and radio sets. Included were four sections of service switchboard, unit-type universal, several magneto and P.B.X. sections. From the Chicago headquarters of the company were: J. B. Edwards, president; Ben Woodbury, vice-president and general sales manager; A. D. Boal, advertising manager, and several of the company's engineers. Among the salesmen were: W. R. Kimmel, Wisconsin; C. M. Bowling and R. W. Glaser, Illinois; H. A. White, Kansas City; H. W. Hogue, In-

diana; F. B. Knefel, Ohio; H. B. Dudley, Michigan; O. F. Schollenberger, Iowa; B. A. Ogden, Ohio; F. M. Parsons, North and South Dakota; E. F. Woodward, New York; and J. R. Shipley, Topeka, Kans.

Leich Electric Co. presented a complete line of telephones and switchboards, showing improvements and additions achieved in the past year. Shown for the first time was a new common battery P.B.X switchboard, marking the entrance of the company into the full relay, common switchboard field. Ten such boards are being built for the U. S. Signal Corps. The Leich improved lamp-signal magneto multiple switchboard also was exhibited by the company's representatives, who included Oscar M. Leich, general manager; A. J. Kohn, sales manager; John Campbell of Ohio; W. S. Fisher of Illinois; Carl Malmborg of Iowa; and B. L. Parker of Genoa.

Monarch Telephone Mfg. Co. showed a big line of switchboards, telephones and construction materials and supplies. Featured were: The M. C.-5001 one-position magneto boards with key shelf supervision; two position combination boards for either magneto or C. B. service; unit position, sectional type multiple C. B. or universal convertible board for 300 to 1200 local lines with toll and rural; new PBX boards; the Como-Fone and Magno-Fone telephones, and other well advertised goods including the specialties handled by the company's supply department. The company's representatives were: H. L. Harris, president; W. T. Benoist, vice-president; L. Q. Trumbull, secretary and treasurer; A. W. Steinke, chief engineer; R. G. Faulhaber, sales manager; Geo. O. Wilson, sales engineer; R. W. Siemund, manager, supply sales; V. A. Moscow, equipment sales; P. A. Foagh, equipment sales; L. V. Anderson, supply sales; R. C. Chock, engineering department; E. F. Kinson, advertising department, and the following field representatives; P. O. Picot, Ohio; C. W. Snyder, Indiana and Michigan; F. R. Paris, Illinois; W. J. Stanton, Wisconsin; R. O. Palmer, Minnesota, South Dakota and North Dakota; H. C. Shear, Iowa and Nebraska; H. L. Housley, Missouri and Kansas, and E. E. Donoho, Texas.

National Carbon Co., famous for its souvenir apples as well as for its long-lived batteries, sent R. R. Brooke and E. F. Schulz to exhibit its No. 6 telephone gray label dry cells, Eveready radio batteries, Eveready Columbia dry cells and Hot-Shot batteries.

Page & Hill, the telephone pole men, were represented by Louis Hill and Grant Harris of Minneapolis; L. E. Morier, of Dayton, O., and F. C. Treat, Chicago.

Painted Displays, Inc., showed a three-part frame in which cards are inserted advertising long distance and local service or other announcements. Chas. A. Thien, V. P., was in charge.

Quick Directory Co. submitted copies of its telephone directories, about 100 directories of different companies. W. L. Griffith, manager, and H. H. Schleppy, contract manager, were present.

Reliable Electric Co., in addition to its well known line of well advertised protective equipment, had on display several new devices. The central office protection designed by Hiram D. Currier aroused wide interest. The company was represented by Wallace L. Cook, president; Geo. W. Rodormer, sales manager, and Joe. E. Stelzer, purchasing agent.

John A. Roebling's Sons Co. was represented by H. O. Cauldwell, E. T. Weart, H. M. Barber, J. A. Blanchard and A. S. Ballis.

Runzel-Lenz Electric Mfg. Co. exhibited its superior and constantly improved cords, cables and wires for telephone and radio purposes. J. M. Lenz, secretary and treasurer, and P. C. Lenz, sales engineer, were in attendance.

Sands Electric Co. exhibited protectors and terminals with many new features. The company was represented by R. G. Sands, president, and J. G. Ballentine, secretary-treasurer.

Eugene C. Stacy's swivel-load binders were explained by Charles T. Lambertson ("Lammy").

Stromberg-Carlson Telephone Mfg. Co.'s exhibit consisted of: Super-service switchboard complete with associated relay apparatus, ringing interrupter and concerter; No. 102 P.B.X. switchboard exhibiting removable trunk circuit plates; No. 5-B four-party harmonic converter; No. 105 high efficiency switchboard; No. 1 sanitary protector frame; No.69A protectors; Telephone panel exhibiting No. 986 desk stand and No. 1155 metal wall telephone with concealed gong; Magneto telephone panel exhibiting No. 896 magneto telephone; Panel covering Stromberg-Carlson construction material; New junior multiple switchboard. Those in attendance were: W. Roy McCanne, president; George A. Scovill, vice-president and sales manager; E. A. Hanover, purchasing agent; E. A. Reinke, assistant sales manager; R. H. Manson, chief engineer; W. T. Eastwood, advertising manager; C. E. Heston, manager, construction material and supplies; E. C. Eidam, assistant chief engineer; C. W. Schafer, manager Chicago office; A. J. Roberts, manager Kansas City office; J. H. Levis, circuit engineer; H. T. McCaig, assistant manager Chicago office; P. D. Myers, Chicago radio manager; N. W. Redmond, Chicago supply manager; J. C. Snyder, P. Winemiller, C. D. Kinne, C. F. Sanders, sales engineers; A. B. Crawford, R. Davis, J. E. Finley, C. W. Watson, J. A. Taggart, W. J. Pfaender, J. D. Kratz, W. C. Caldwell, J. P. Galligan, sales representatives.

Templeton, Kenly & Co. showed Simplex pole jacks; a new five-ton pole-pulling, pole-straightening and guy-line pulling jack, also various sizes of cable reel jack used for pulling in cable, were shown. C. A. Crain, Jr., and W. H. Kreer demonstrated.

Unique Mfg. Co. presented various sizes and styles of the Unique gasolene and kerosene furnaces and blowtorches. New items included a kerosene platform heater and a solder iron handle on an entirely new principle. Pres. Goller presided in person, assisted by Oren Foster and John Sturm of the sales department.

West Mfg. Co., through Clarence A. Anderson, president, exhibited the Anderson trouble-finder test set, on a miniature telephone line.

Glandon Named to Lead Independent Pioneers at Annual Meeting

Chicago, Ill.—E. D. Glandon of Pittsfield, Ill., was elected president of the Independent Pioneer Telephone Association at its annual meeting which followed the concluding session of the United States Independent Telephone Association convention at Chicago. Mr. Glandon is one of the best known figures in the Independent field and naturally is certain of unqualified support in an administration to further the interests of the Independent veterans. Frank A. Knapp of Bellevue, O., is the retiring president. During his regime the association increased its membership to 870 and witnessed a solid development of its finances, according to the report of J. K. Johnston who has been secretary-treasurer of the body since its organization, six years ago. Mr. Johnston was re-elected to his office at this meeting.

Following its usual practice, the Pioneers' association staged a big luncheon and vaudeville show at the convention. There were more than a thousand present at this affair which wound up in an hour of dancing. Many of the equipment and supply companies joined the Pioneers in conducting this event, by defraying the expense. The luncheon program was put on by a committee of Pioneers consisting of George Rodormer, chairman; John F. Jaap, secretary-treasurer; and Frank Eldridge, O. V. Dodge, Carl Shafer, L. Q. Trumbull and A. D. Boal.

Vice-presidents elected by the Independent Pioneers are:

W. H. Bryant, Mobile, Ala.; C. A. Rolfe, Redlands, Calif.; W. G. Brorein, Tampa, Fla.; Otto Wettstein, Jr., Orlando, Fla.; H. D. Currier, Chicago; Frank L. Eldridge, Chicago; J. B. Edwards, Chicago; John W. Coffey, Indianapolis, Ind.; Frank V. Newman, La Porte, Ind.; Chas. C. Deering, Des Moines, Iowa.

John A. Gustafson, Fredonia, Kans.; L. M. Kraege, Topeka, Kans.; H. B. Smith, Ashland, Ky.; J. B. Lockwood, Muskegon, Mich.; Houck McHenry, Jefferson City, Mo.; W. R. McCanne, Rochester, N. Y.; J. G. Ihmsen, Albany, N. Y.; John H. Wright, Jamestown, N. Y.; Frank L. Beam, Mt. Vernon, Ohio; Conrad Kipp, Greenville, Ohio; Frank L. McKinney, Columbus, Ohio; E. J. Boase, Fredrick, Okla.

Chas. E. Wells, Hillsboro, Ore.; E. D. Schade, Johnstown, Pa.; W. H. Wilson, Clearfield, Pa.; H. C. Tucker, Sumter, S. C.; W. G. Bickelhaupt, Aberdeen, S. D.; Jas. N. Cox, Cookville, Tenn.; J. C. Duncan, Knoxville, Tenn.; W. N. McAnge, Jr., Bristol, Tenn.; R. W. Garner, Waco, Texas; C. L. Ovitt, Enosburg Falls, Vt.; Rodney M. Coggin, Warsaw, Va.; F. W. Twyman, Charlottesville, Va.; F. B. MacKinnon, Chicago; W. F. Goodrich, La Crosse, Wis., and Wm. L. Smith, Neillsville, Wis.

SAVE 60% ON CORDLESS SWITCHBOARDS

Kellogg 8-station, 2 trunks visual type	$ 75.00
Kellogg 15-station, 3 trunks, visual type	100.00
Automatic Elec. Co. 7-stations, 3 trunks, visual type	75.00
Automatic Elec. Co. 8-stations, 2 trunks, visual type	75.00
Automatic Elec. Co. 7-stations, 3 trunks, lamp type	100.00
Automatic Elec. Co. 8-stations, 2 trunks, lamp type	100.00

The above boards are entirely refinished.

BUCKEYE TELEPHONE AND SUPPLY CO.
COLUMBUS, OHIO

Everstick

Approved by Large Operating Companies For the Following Strains

6" 2-way	2,200 lbs.
6" 4-way	6,000 lbs.
8" 2-way	6,000 lbs.
8" 4-way	10,000 lbs.
10" 4-way	16,000 lbs.

Write for Details

Everstick Anchor Co.
ST. LOUIS, MO.

Manford Savage, Independent Leader, Is Dead

Champaign, Ill.—Manford Savage, president of the National Independent Telephone Association from 1911 to 1914 and three times president of the Illinois Independent Telephone Association, died here October 24, at the age of 72. Mr. Savage had not been active in the telephone industry for several years prior to his death.

For a number of years Mr. Savage was president of the old Home Telephone Co. of Champaign. He was active in state and national telephone association affairs and brought into his association work a brilliant legal mind.

New Take-Up Reel Gets Strong "O. K."

Tulsa, Okla.—A new take-up reel manufactured by the Braden Co., Tulsa, Oklahoma, who are also manufacturers of the R-B Winch, bids to revolutionize methods for reeling in and paying out wire lines. The R-B Take-Up Reel is constructed in two parts, of all steel material welded and riveted. It is designed to be used exclusively with the R-B Winch, utilizing the power transmitted through the winch. It is quickly attached and removed from the winch drum by means of four screw bolts. When the wire is reeled in, the reel is removed

Braden's New Reel

from the winch drum and taken apart, leaving the wire coiled loosely on the base of the reel. Wrap wires are applied to keep wire from uncoiling and in perfect condition for future use.

Dismantling tests made by disinterested parties in no wise connected with the manufacture of this reel, have shown it to save over 80 per cent of the cost of dismantling methods. This refers to reeling wire only. A further saving is affected through the fact that the coil produced by the R-B take-up reel is without kinks, the inside diameter a perfect circle, and the compactness of the coil providing easier handling and is more conveniently paid out when such wire is again put into service. The R-B take-up reel has no moving parts and no adjustments. It can be furnished with payout attachment if desired, for use in connection with the R-B winch for either stationary or movable pay-out.

Interested parties desiring further details regarding dimensions, capacities, weights and prices should write The Braden Co., Tulsa, Oklahoma.

J. W. Gleed, Southwestern's Attorney, Dies

Topeka, Kan.—James Willis Gleed, general attorney for the Southwestern Bell Telephone Co. died here Oct. 12, from a heart attack. Mr. Gleed had planned to retire soon from his position as chief of the Southwestern's legal staff where he had worked for 22 years. He was prominent in the legal profession and had been connected with many important cases.

Otto Bernz Co. Brings Out Two New Furnaces

Newark, N. J.—Otto Bernz Co., Inc., is introducing two new style furnaces, the No. 19 bulb, and No. 20 pump, appliances. These furnaces are entirely new and replace the Bernz No. 13 and No. 14 furnaces. Bernz also has discontinued its No. 16 and No. 17 furnaces, which are similar to the No. 14, except that the No. 16 furnace was furnished with a combination shield and the No. 17 with a 9¼ in. shield. The No. 21 and No. 22 furnaces take the place of the two discontinued numbers.

Features of the new No. 19 and No. 20 furnaces, to which the Bernz company calls attention are:

Handle made of coppered steel wire and fitted with nickel-plated wire grip.

Handle hold soldering irons. To lower handle, turn to other side of furnace. (Patent applied for.)

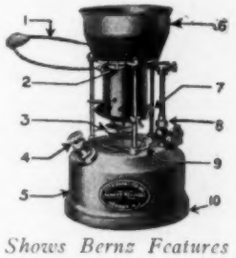
Reservoir has funnel. Filler plug has patented "dust proof" cap.

Patented "never leak" pump which is a guard against leaks.

Heavy seamless drawn steel reservoir and bottom. Three extra heavy bushings at top welded and brazed. Bottom welded.

Positively no soft solder used. Capacity one gallon.

Shield is now made in one piece from heavy sheet steel.



Shows Bernz Features

Dished steel plate keeps heat from reservoir, catches over-flow from coil cup, also holds coil cup in place. By lowering this plate, coil cup can be removed without unscrewing any nuts or removing top plate. (Patent applied for.)

Coil removed by unscrewing union and lowering coil cup. Not necessary to unscrew any nuts or to remove top plate. (Patent applied for.)

Malleable iron plate brazed to reservoir which holds extra heavy uprights. Eliminates three openings. (Patent applied for.)

Ring welded to bottom which reinforces reservoir.

New York City—J. H. Bunnell and Co., makers of telegraph, fire alarm and other similar apparatus, have moved into their new factory at Pearl and Prospect streets, Brooklyn. Main office and warehouse continues to be located at 32 Park place, New York.

Hall and Gates Merge Four Oregon Properties

Marshfield, Ore.—Charles Hall, president of the Coos and Curry Telephone Co., and Earl W. Gates, superintendent and in active charge of the Coos and Curry company, have bought all stock of the Hillsboro Telephone Co., controlling interest in the Scholls Telephone Co., controlling interest in the McMinnville Telephone Co., and half interest in the Western Oregon Telephone Co. of Forest Grove. Detailed supervision of the operation of these companies will be handled by resident managers with Messrs. Hall and Gates in active management of the associated properties.

Continental Buys Nebraska Properties

Albion, Neb.—Continental Telephone Co. has bought the properties of the Monroe Telephone Co. which has its headquarters here and other exchanges at Monroe, Newman Grove, Platte Center, Tarnov, Lindsey and other points. It is one of the largest Independent companies in Nebraska and was owned by John P. Bratt and the estate of Alfred Bratt.

Olathe, Kan.—Olathe Citizens Telephone Co. has been bought by the Southwestern Bell Telephone Co.

The Anderson TROUBLE FINDER

Gives Your Troubleman Facilities for Working Alone

Formerly, when the trouble man was sent out on a line to locate trouble, the results of his tests were almost entirely dependent upon the test clerk. Now one man equipped with an Anderson Trouble Finder can do the trouble shooting alone without the aid of the test clerk, and in a much shorter time, thus avoiding the expense involved in tying up the lines for a long period.

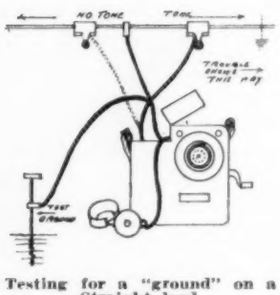
This portable telephone and trouble finder is a reliable, compact instrument that is easily connected to the line without opening the circuit. The test is made by snapping the finder coil on the line and listening for the tone in the receiver while turning the generator.

The time and money saved with the Anderson Trouble Finder over a short period of time will soon pay for itself many times over.

THE WEST MANUFACTURING CO.

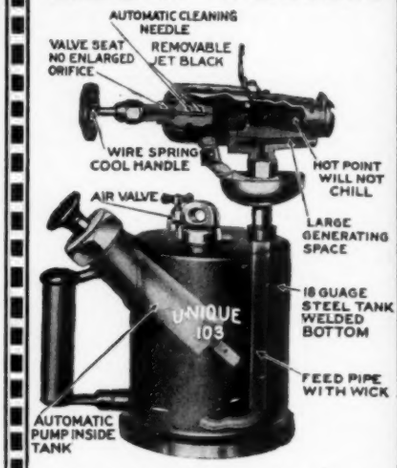
447 Monadnock Block **Chicago, U. S. A.**

Price only $40.00



Testing for a "ground" on a Straight lead.

UNIQUE BLOW TORCH



It starts quickly, operates in any position, and produces a remarkable heat. It is a great worker in cold and windy weather.

The automatic orifice cleaner, one of the details shown in the illustration, is but one of a number of exclusive features that make the Unique your greatest value in blow torches.

Painstaking care by interested workmen, an actual "burning test" before shipping, is just another detail responsible for their uniformity and efficient burning qualities.

Write for complete details

Unique Manufacturing Co.

113 N. Desplaines St. CHICAGO, ILL.

TELEPHONE EQUIPMENT FOR SALE—CHEAP

All Parts Tested and Guaranteed

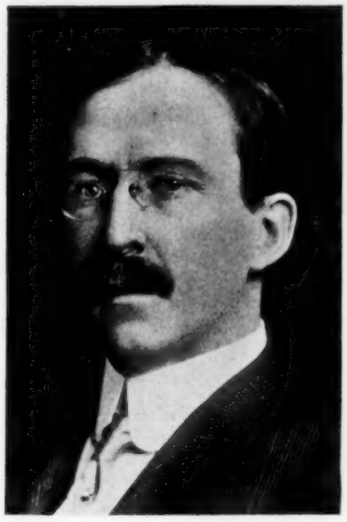
Monarch Desk Sets, complete	$8.00
Monarch Generators, 3-Bar	.50
Monarch 2500-Ohm Ringers	.50
Monarch 80-Ohm Ringers	.20
Monarch Local Battery Induction Coils	.20
Monarch Local Battery Transmitters	.50
Monarch 4-Spring Switch Hooks	.25
Monarch 3-Bar Long Type Telephones —2500-Ohm	5.00
American Electric 1000-Ohm Ringers	.50
American Electric Common Battery Wall Sets	5.00
Swedish American 80-Ohm Ringers	.25
Swedish American 100-Ohm Ringers	.50
Swedish American Local Battery Transmitters	.50
Stromberg Carlson 80-Ohm Ringers	.50
Stromberg Carlson Local Battery Transmitters	.75
Stromberg Carlson Common Battery Transmitters	.75
Stromberg Carlson 1 & 2 M. F. Condensers. 8x4½x⅝	.10
Stromberg Carlson 1 & 2 M. F. Condensers. 2⅝x4½x⅝	.10
Swedish American 1 & 2 M. F. Condensers. 8⅜x4⅜x⅝	.10
American Electric 2 M. F. Condensers. 9⅝x4½x⅝	.10
American Electric 3 M. F. Condensers. 4⅜x4½x⅝	.10
American Electric Switch Hooks. Complete with Hook and Plate	.25
Double Pole Double Throw Battery Switches	.15
Generator Cranks for Independent Generators, assorted	.10
Common Battery Induction Coils	.15
Western Electric 2 M. F. Condensers. 4⅜x8¾x⅝	.10
Repeating Coils, No. 37A, Large Type	1.50

Western Telephone Rebuilt Co.

3230 Chouteau Avenue ST. LOUIS, MO.

Form New Manufacturing and Supply Company

H. L. Harris, President



P. C. Burns, Chairman of the Board

W. F. Benoist, First Vice-President

Formal announcement is made of the formation of a new corporation in the manual telephone equipment manufacturing and supply field. The activities of the new organization, known as American Electric Co., Inc., will be of vital interest and importance to the entire telephone field and its allied lines.

The new corporation has purchased the entire plant, good-will and other assets of the former American Electric Co. and has also arranged to take over and continue the manufacture of the complete line of products formerly manufactured or sold by the Monarch Telephone Manufacturing Co., including its well-known line of manual common battery and magneto telephone equipment and telephone and electrical supplies.

American Electric Co., Inc., has taken over and now occupies the extensive manufacturing plant formerly owned by the American Electric Co., and immediate steps will be taken to expand its production capacity to take care of increased business. The products of the new corporation will be an extensive line of manual common battery and magneto telephone equipment, including all types that have heretofore been manufactured by the former American and Monarch companies. Its products will include also the complete line of telephone electrical supplies formerly handled by the Supply Department of the Former Monarch company as well as Burns radio specialties and office appliances. The manual switchboard equipment formerly made by the Monarch Telephone Manufacturing Co. for Automatic Electric, Inc., for use in connection with automatic equipment of their manufacture, will also be made by the new company.

Customers of the two former companies, besides being able to secure all equipment and parts these companies have previously manufactured or supplied, will enjoy the advantage of the greatly improved service and production facilities that will result from the expanded resources and increased personnel of the new company.

The splendid manufacturing resources which will be provided through the expansion of the present plant are augmented by excellent facilities for making prompt shipments, including extensive warehouses, private switch track and close proximity to all important freight depots.

Sales Personnel Is Same

The sales personnel of both the former companies has been taken over by American Electric Co., Inc. These men have all had long and successful experience in the telephine field, each one being recognized as an expert in the particular branch of the business with which he is associated.

The officers and directors of the new corporation are well-known men of high standing in the telephone business, with a wealth of experience in the engineering, manufacturing and marketing of telephone products and supplies that will be of invaluable service in their new connection with the industry.

P. C. Burns, former president of the American Electric Co., and now chairman of the board of the new corporation, has, for the past forty-five years been one of the most active men in the telephone business, having been instrumental in bringing about many of the improvements in telephone apparatus and service which have been adopted as standard in the manufacture of modern equipment. Mr. Burns first designed the standard compact magneto telephone cabinet; he was first to make and market the now universally adopted concealed binding post receiver; he made the first commercially successful self-restoring drop switchboard, known throughout the telephone business as the Burns "Express"; he was first to make and sell the present standard type of desk stand, and to design and sell the adjustable head band receiver universally used for switchboard and radio work.

In 1900, Mr. Burns marketed the "harmonic" type of ringing system, and was the first to make and sell the removable lever switch-hook and the granular carbon "long distance" transmitter. Mr.

L. Q. Trumbull, Secretary-Treasurer

H. D. Currier, Vice-President and Chief Engineer

R. G. Faulhaber, Sales Manager

Burns is responsible also for many other important telephone devices, but the above will serve to indicate his experience and position as one of the leading pioneers in the telephone business.

H. L. Harris, vice president of Theodore Gary & Co., Kansas City, and executive vice president of Automatic Electric Inc., is president of the American Electric Company, Inc. Mr. Harris' more than 30 years of experience in all branches of the telephone industry and his experience in sales, engineering and executive capacities is so well-known as to need no comment.

Mr. Harris has been actively associated with the telephone business since Jan. 1, 1896, beginning on that cold winter's day as a ground man in a construction gang. During the ensuing period of eleven years, Mr. Harris gathered experience in all departments of telephone operation, and in March of 1907, joined the engineering department of the former Dean Electric Co., of Elyria, Ohio. As sales engineer for the Dean Electric Co., the Garford Manufacturing Co., and the Stromberg-Carlson Telephone Mfg. Co., Mr. Harris has won a wide and firm acquaintanceship in the telephone manufacturing field. In 1919, Mr. Harris returned to the operating field, being appointed general manager for the Kansas City Home Telephone Co., and in the last few years has been associated in an executive capacity with the various enterprises of Theodore Gary & Company of Kansas City. With this background of experience, Mr. Harris is ably fitted to take over his additional duties as president of American Electric Company, Inc.

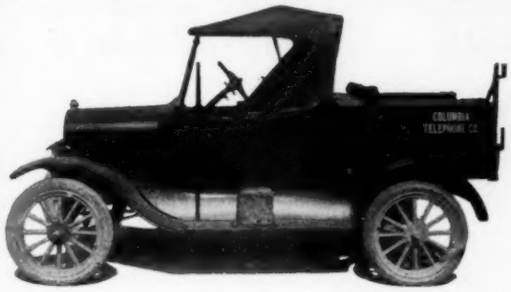
W. F. Benoist, first vice president of American Electric Company, Inc., has devoted nearly thirty years to telephone work, and during this time has not only acquired a wide personal acquaintanceship in the field, but has also familiarized himself thoroughly with all departments of the business. He entered the telephone business as assistant secretary of the Kinioch Long Distance Telephone Co., of St. Louis, and later, as consulting engineer in the same city, was concerned in the construction and operation of a number of telephone plants in the West and Southwest. In 1909, Mr Benoist entered the employ of Automatic Electric Co. as assistant sales manager. Later, he was made successively sales manager and assistant general manager, finally being appointed vice president and treasurer of Automatic Electric, Inc.

H. D. Currier, well-known in the telephone operating field through his association with the Kellogg Switchboard and Supply Company as chief engineer, has been appointed vice president and chief engineer of American Electric Co., Inc. Mr. Currier began his telephone career in 1897 in the engineering department of the Chicago Telephone Co. In 1901, he was placed in charge of the outside plant of the Maryland Telephone & Telegraph Co. of Baltimore. In 1903, he entered the employ of the Western Electric Co. and was placed in charge of the circuit laboratories. In 1907, Mr. Currier took a position as engineer with the Duplex Metals Company, manufacturers of Copper-Weld Wire. Mr. Currier has added to this liberal background of training his experience with the Kellogg company, whom he served so long and well as chief engineer. Mr. Currier comes to his new duties as vice president and chief engineer of the American Electric Co., Inc., with a profound knowledge of the needs of the telephone industry that will be an invaluable guide in the conduct of the technical affairs of the new company. Mr. Currier is especially proud of having been recently awarded a thirty-year badge by the Independent Telephone Pioneer Association.

Edward Tubbs, Auditor

L. Q. Trumbull began his career in the telephone field immediately after leaving college in 1901. In 1904 he accepted a position with the Monarch Telephone Manufacturing Co. of Chicago as assistant sales manager. When the Monarch factory and offices were moved to Fort Dodge, Iowa, in 1911, he was appointed sales manager and in 1917 was made secretary in addition. In 1920, Mr. Trumbull was appointed general manager of the Monarch company, in which position he continued until the first of this year when he was elected secretary and treasurer. Because of his varied experience in an executive capacity for the Monarch company, Mr. Trumbull has been appointed secretary and treasurer of the American Electric Co., Inc.

R. G. Faulhaber, sales manager for American Electric Co., Inc., has had eighteen years of continuous service with both telephone manufacturing and oper-



Type SC-172

Cabinet Body for Ford Roadster

A STRONG, light-weight, convenient cabinet body used in connection with the standard Ford roadster. Soon repays its first cost. Standard equipment with some of the largest telephone and power companies. Equipment includes ladder irons and rear fenders.

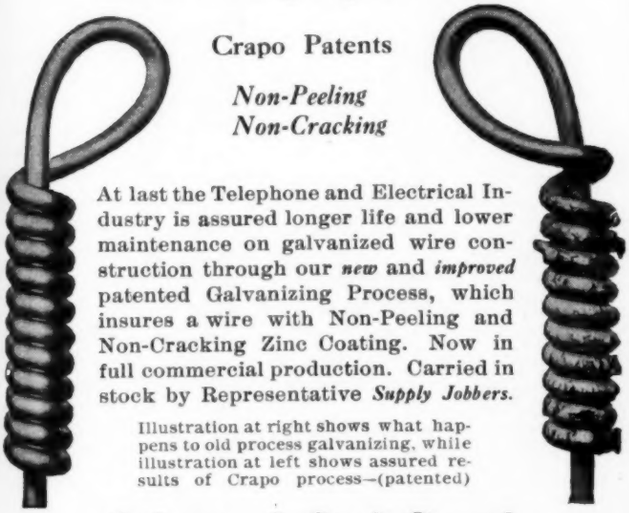
Write for Bulletin No. 214 giving prices and full information

HOOVER BODY CO.

YORK, PENNSYLVANIA

"INDIANA"

Double Galvanized Telephone and Telegraph Wire



Crapo Patents

Non-Peeling
Non-Cracking

At last the Telephone and Electrical Industry is assured longer life and lower maintenance on galvanized wire construction through our *new* and *improved* patented Galvanizing Process, which insures a wire with Non-Peeling and Non-Cracking Zinc Coating. Now in full commercial production. Carried in stock by Representative *Supply Jobbers.*

Illustration at right shows what happens to old process galvanizing, while illustration at left shows assured results of Crapo process—(patented)

Galvanized Steel Strand

Standard or Commercial, Siemens-Martin, High Strength and Extra High Strength Grades

Indiana Steel & Wire Co., Muncie, Ind.

The Standard for Telephone Work

KESTER SOLDER

Rosin Core

In the telephone field Kester Solder is the standard for both maintenance and production work. The comprehensive line of Kester Solder embraces a range of sizes from approximately 1/4″ to 1/16″ in diameter. Standard Acid Core diameter, being 1/8″ and standard Rosin Core diameter 3/32″. Packed on one, five, ten and twenty pound spools, there is a range of size and style of package suitable for every practical purpose.

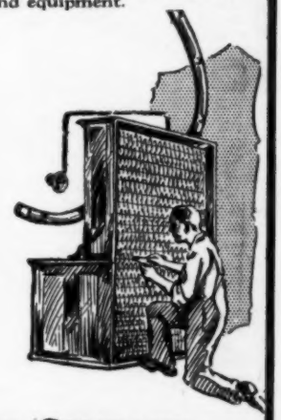
For heavier electrical work Kester Acid Core Solder can be used with considerable saving in time, labor and material.

For the more delicate electrical work on switchboards, etc., only Kester Rosin Core Solder should be used. Its pure rosin flux eliminates every danger of corroded work.

Most telephone companies specify Kester Rosin Core Solder No. 2, 50 core for line splicing as it not only conforms with the standard specifications, but also speeds up this class of work.

Kester Solder either rosin or acid core is handled practically everywhere by jobbers of telephone supplies and equipment.

We maintain a completely equipped research laboratory where we have solved soldering problems for many manufacturers. While our standard line of Kester Solder is adequate for practically every soldering job there are occasions where a specially developed solder and flux are required.



Consult our Research Engineer on your soldering problems

CHICAGO SOLDER COMPANY

4218 Wrightwood Avenue Chicago, Ill.

Originators and world's largest manufacturers of Self Fluxing Solder

ating companies. His first experiences were gained with the Dean Electric Co., the Garford Manufacturing Co., and the Stromberg-Carlson Telephone Manufacturing Co. as sales representative. Later he was employed as purchasing agent for the Kansas City Home Telephone Co. Five years later he was appointed assistant purchasing agent for Automatic Electric Co. In January, 1926, Mr. Faulhaber was appointed sales manager of the Monarch Telephone Manufacturing Co., and he will be connected with the new corporation in a similar capacity.

Edward Tubbs, formerly auditor for the Monarch company, has had thorough experience as an accountant and auditor previous to entering the employ of that company. Mr. Tubbs has been appointed auditor for the newly-formed American Electric Co., Inc.

The above mentioned officers comprise the board of directors of the new corporation. With this exceptional personnel, American Electric Company, Inc., establishes itself in the telephone manufacturing field with unusually strong advantages to its customers, both present and prospective. It is expected that the line of products offered as well as the facilities and resources back of them, will be especially attractive to those whose business it is to render telephone service to the public and to others who make use of any of the specialties the new company has to offer.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

of Telephone Engineer, published monthly at Chicago, Ill., for October 1, 1926.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the state and county aforesaid, personally appeared W. H. Graffis, who, having been duly sworn according to law, deposes and says that he is the business manager of Telephone Engineer and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, general manager and business manager are:

Publisher — Wm. H. Graffis & Sons, 225 N. Michigan Ave., Chicago, Ill.

Editor—Herbert Graffis, Chicago, Ill.

Business Manager—W. H. Graffis, Chicago, Ill.

Advertising Manager — Jos. M. Graffis, Chicago, Ill.

2. That the owners are (give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock):

W. H. Graffis, Herbert Graffis and Jos. M. Graffis, all of 225 N. Michigan Ave., Chicago, Ill.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent of more of total amount of bonds, mortgages or other securities are (if there are none, so state) —None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder of security holder appears upon the books of the company as trustees or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant s full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any person, association or corporation has any interest, direct or indirect, in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise to paid subscribers during the six months preceding the date above is..... (This information is required from daily publications only.)

TELEPHONE ENGINEER,
W. H. Graffis, Bus. Mgr.

Sworn to and subscribed before me this 22d day of September, 1926.

(Seal) ELEANOR DIENES.

(My commission expires March 24, 1929.)

Oklahoma Holds Rapid-Fire Series of Telephone Meetings

By H. W. HUBENTHAL

Oklahoma City, Okla.—The 1926 Oklahoma district meetings were a distinct departure from the manner in which they were held and conducted as in preceding years. Twelve meetings were planned and carried out; the schedule of meetings was on time without a break or interruption, and without working hardships on any one.

The schedule was spread over a period of three weeks—September 6th to September 23rd—but conveniently arranged so that those who desired to attend the entire series could also and easily spend at least one day of each week at headquarters in Oklahoma City. Several took advantage of this arrangement. The manner of holding the meetings on successive days was principally at the suggestion of the manufacturers' sales representatives, who otherwise found it difficult to attend all the meetings if they were held intermittently and several days or weeks between meetings. At every meeting manufacturers and jobbers were represented. The method proved decidedly advantageous to all. It is nothing new but has found great favor and has met with success by telephone people in many other states.

No regular program for the meetings was arranged. This was another advantage in that it afforded telephone people at the meetings to bring up and be heard on matters which interested them most. It worked fine and many subjects were presented and discussed which otherwise would not have been considered. It also saved the Association about $60, which was formerly paid out for printing of programs which were never carried out completely at other meetings. Another very decided saving was effected in that the expense of holding these twelve meetings was much less than what it formerly cost to hold eight meetings. The engineer was the only member of the Association office staff who attended the meetings. He traveled 1,547 miles, was out twenty days on this trip as compared with twenty-four days last year, and his expenses amounted to only $107.00. The Southwestern Bell employes who attended the meetings were greatly pleased and repeatedly expressed themselves to that effect, with the series arrangement of the meetings because it afforded them one of the best opportunities to present, explain and discuss with independent companies their new toll rate schedules, classification and practices which were established October 1, 1926.

Results of these meetings as set forth by facts and figures will clearly show that the manner in which these meetings were held was highly satisfactory and advantageous to telephone people, insofar as it afforded everybody an opportunity to attend at a nominal expense, and to conveniently attend more than one meeting. The meetings in the way they were arranged did exactly what we hoped for—a much larger attendance than heretofore. The total attendance at all meetings was 500 as compared with 406 last year, or about twenty per cent greater attendance at the 1926 meetings. It would have been greater had it not been for unfavorable weather conditions at the Hanna meeting, in the second district, where one of the largest meetings has heretofore been held, and scheduling the meeting at Sulphur so late in the year, Sulphur being a summer resort. There were more independent people, more independent companies, more manufacturers represented, and a greater number of the public attended this year than last year. The only less number per capita attendance at all the meetings in any class was the Southwestern Bell Company representatives, having an attendance at all meetings of 32 as compared with 60 for last year. There were from one to six sales representatives at all meetings. This year a bigger and better contact was established between telephone people and local citizens. Local managers and citizens of the various towns where these meetings were held gave us hearty welcome, entertaining the meetings with noonday luncheons, musicals, etc., at nearly every town where meetings were held.

The success of the meetings was

Safety Always— for the Lineman

Pat. Apr. 28, 1925

PEIRCE LINEMAN'S SAFETY PLATFORM

The Peirce LINEMAN'S SAFETY PLATFORM is a development for efficiency and safety in line construction and operation.

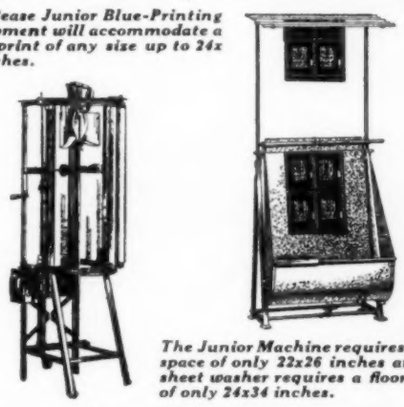
With the LINEMAN'S SAFETY PLATFORM a lineman can always place himself in the proper position to do his work—to do it in the least possible time and with the greatest safety to himself. The many uses that this appliance can be put to, and its ready adaptability to almost any position, makes it a most valuable adjunct to construction and maintenance gang equipment.

Connecting large transformers, making up cable joints, replacing and washing hi-line insulators and soldering joints are a few of the many uses where the SAFETY PLATFORM can be used to a great advantage.

Hubbard and COMPANY

PITTSBURGH • OAKLAND, CAL. • CHICAGO

The Pease Junior Blue-Printing Equipment will accommodate a blue-print of any size up to 24x 36 inches.



The Junior Machine requires a floor space of only 22x26 inches and the sheet washer requires a floor space of only 24x34 inches.

For The Moderate User of Blue Prints

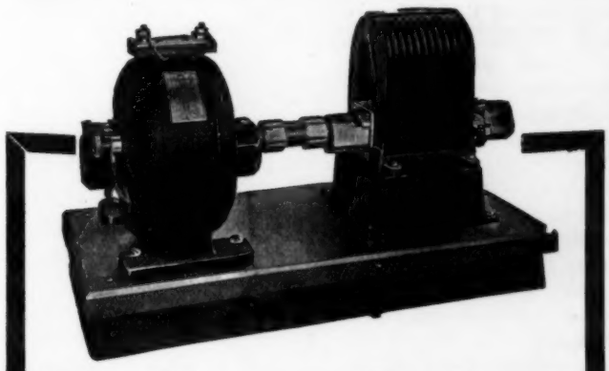
Now every drafting room, no matter how small, may enjoy the advantage of making perfectly finished blue prints whenever wanted. No special electrical connections are needed as the Pease Junior can be connected to the lighting circuit and will operate on either 110 volt or 220 volt AC or DC current.

No more open bath trays, dripping prints, and wet floors. The Pease Junior Machine and Sheet Washer eliminate all that and offer speedy operation—high quality work—durable construction and low price.

Write for Pamphlet MJ-07

THE C. F. PEASE COMPANY

807 N. Franklin St. Chicago, Ill.



Holtzer-Cabot

MAGNETO—RINGING—MOTOR—GENERATOR

Positive Ringing Service

Must be maintained in every exchange. The Holtzer-Cabot Magneto-Ringing Motor-Generator insures a uniform ringing current wiping out all complaint of subscribers that their bells do not ring satisfactorily.

Save the money that must otherwise be spent for battery renewals and upkeep. This machine offers exchanges perfection in ring service. Give it a test in your exchange. We stand back of it.

The Holtzer-Cabot Electric Co.

125 Amory St., Boston, Mass.

6161 So. State St., Chicago, Ill.

largely due to the efforts of L. W. Scherer, manager of the Yale Telephone Co. and chairman of the Telephone Division of the Association. He, with his superintendent, Joe Nelson, attended nine of the meetings, both contributing to the program at all meetings, addressing at the luncheons on the relation of the utility to the public, on radio and standard rules and regulations of telephone companies. Manager Scherer and Superintendent Nelson attended these meetings without charge for their time, and at all meetings gave effective and valuable talks on maintenance and construction. Mr. Nelson and C. G. Gardner of the Kellogg Switchboard and Supply Co. gave demonstrations of the importance in value of voltmeter testing of central office equipment in exchange operation for proper maintenance of plant. This was a feature of the meetings never heretofore presented at meetings. It proved of great interest to visiting telephone people.

Fine cooperation was given by W. A. Kitchen, assistant electrical superintendent, and J. Herbert Philips, radio engineer, of the Oklahoma Gas & Electric Co., who attended three of the meetings and made addresses on inductive interference and coordination and on radio. Another visitor was Snowden M. Hunt of the Southwestern Light & Power Co., who impressed telephone people with an address on good public relations at the Comanche and Roosevelt meetings. Principally among the many subjects presented and discussed were: "Central Accounting Systems" by J. W. Walton, president, Oklahoma Telephone Co.; "Directory Listings, Advertising and Publications," "Joint Pole Construction and Association Activities," "Traffic and Commercial Problems," "Observations of Telephone Service from the Public's Standpoint" by telephone subscribers. Colonel Graves Leeper, noted public speaker and humorist, and Benjamin Hennessey of Hitchcock, poet and lecturer, entertained visitors and delegates at the Sulphur and Watonga meetings.

Although the telephone membership of the Association already represents 85 per cent of the telephone industry in Oklahoma, five new telephone members were secured as a direct result of these meetings.

The facts and figures as hereinbefore set out prove conclusively that the meetings were decidedly successful, and that the holding of the greatest number of meetings is beneficial to the greater number of people. The 1926 meetings were the best and most profitable in the history of the Association.

Bodcaw, Ark.—Bodcaw Telephone company has been formed to build line from Bodcaw to Hope.

State Association Heads Confer on Financing Activity

Chicago, Ill.—There were 45 representatives of 16 state associations at the annual meeting of the state association executives held during the meeting of the U. S. I. T. A. here.

Financing as might be expected, took the floor for the greater part of the time. Just what were the virtues and vices of the buying and consolidating interests who have been sweeping through a good part of the Independent territory provided the topic for some experts to discuss.

In Wisconsin it was said that the "wild-cat" financiers have been holding a field day and not without some good to the state's telephone companies as the substantial bankers of the Badger country have had their attention attracted to telephone properties by the operations of the so-called financiers. Consolidation along proper lines is not a bad thing, according to the Wisconsin conclusion. Contiguous property buying is O. K., but "checker-board" consolidations are not justified, was the opinion of the Wisconsin representatives.

That a lot of poor companies would not make one good company was the decision arrived at by Charles A. Rolfe, head of the California association. Some of the states had been immune to the wave of buying and consolidation, while in other states, the commission regulations and the manner in which they were enforced presented insurmountable obstacles to the promoter who was suspected of being not of the "pure and simple" promotional type working for a moderate profit and being acquainted with the requirements and conditions peculiar to the telephone industry.

There was not doubt of consolidations being the solution of many of the smaller companies' problems in the opinion of a number of the state officials present. The advantages of centralized management and the inability of the managers of the individual properties to make a good salary out of them were set forth as some factors that recommended consolidation.

Warren Named as Canadian President at Hard Working Convention

Montreal, Que.—W. R. Warren of the Saskatchewan Government Telephones was elected president of the Telephone Association of Canada at the sixth annual meeting of the organization. Other officers and directors elected were:

Vice president: O. J. Fraser, New Brunswick Telephone Co., St. John, N. B.

Secretary-treasurer: B. Jones, Saskatchewan Government Telephone, Regina.

Directors: Gordon Farrell, British Columbia Telephone Co., Vancouver, B. C.; W. C. Bruce, Alberta Government Telephones, Edmonton, Alta.; H. Coddington, Manitoba Telephone System, Winnipeg, Man.; R. Burrows, The Bell Telephone Co., of Canada, Montreal; S. B. Ebbert, New Brunswick Telephone Co., Halifax N. S.; A. MacKay, Maritime Telegraph & Telephone Co., Halifax, N. S.; and H. Sherman, Saskatchewan Government Telephones, Regina, Sask.

More than 100 telephone men from various parts of the Dominion attended the convention and applied themselves to some serious and spirited discussion of the convention papers which had been printed and distributed prior to the meeting in order that the discussion might be conducted along the most valuable lines. Round table conferences on plant, accounting and engineering topics were held during the meeting and were well attended. The speakers at the Canadian meeting, and the subjects of their addresses:

H. B. Sherman, of The Saskatchewan Government Telephones, "Development of Equipment for Toll Dialling."

Papers were presented by members of the staff of the Bell Telephone Co. of Canada as follows:

G. H. Rogers, general commercial engineer, "The Commercial Survey in Plant Extension Work, What It Is and Its Importance."

R. V. Macaulay, plant extension engineer, "Its Relation to Plant Extension Engineering."

A. M. Mackenzie, outside plant engineer, "Field Engineering Scope and Responsibility."

E. L. Pugsley, plant accounting methods clerk, "Plant Accounting—Plant Units and Retirements."

B. E. Howell, supervisor of plant accounting methods, "Apportionment of Overhead, etc., Expenses."

M. J. Bogue, installation supervisor, "Installation."

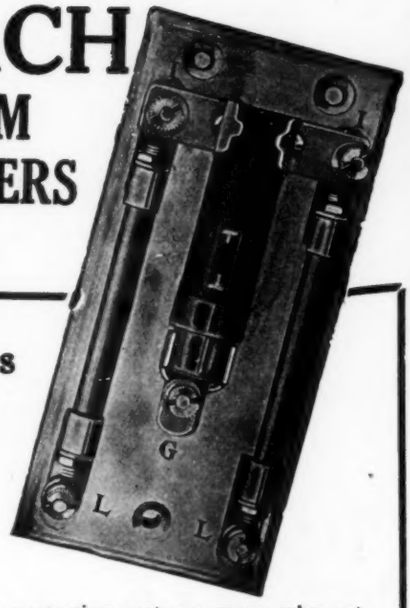
H. F. Bush, foreign wire relations engineer, "The Problem of Inductive Coordination with Power Lines."

M. J. Aykroyd, construction supervisor, "Plant Methods, Construction."

D. MacDonald, maintenance supervisor, "Maintenance."

J. L. Clarke, transmission engineer, "Long Distance Line Design."

BRACH VACUUM ARRESTERS



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When the best protection costs no more, why not have it? BRACH arresters insure; non-grounding of lines, cables, clear transmission, balance of potential between pairs, and full protection against power crosses or lightning. There are no carbons to clean and no maintenance bills.

You can readily afford BRACH Vacuum Arresters at our present low prices. Type 440, showr above, is furnished with porcelain base, fuses and mountings.

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DEPENDABILITY and long life are the two essentials in a contact point. This "heart of the machine" should function evenly and steadily over long periods of time—it should not need replacement at frequent intervals.

Baker Contact Points are made with this principle always in mind and the name "Baker" assures that perfect performance, without constant renewal, which is the outstanding characteristic of a *good* contact point. Our contacts are made of Platinum, Iridio-Platinum, Silver and Special Alloys. There are sizes and types for all purposes.

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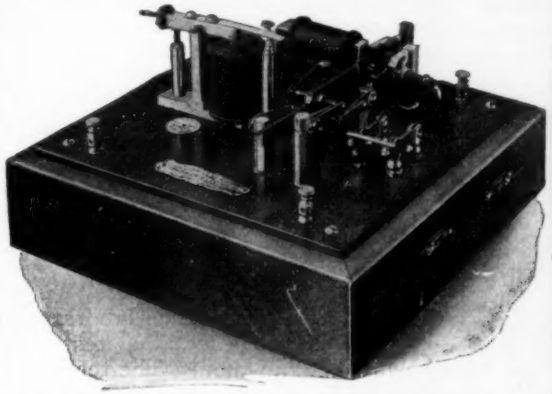

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Complete details of the Warner will be sent you on request.

WARNER ELECTRIC CO.
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Anderson Trouble-Finder Now Chicago Made

Chicago, Ill.—Factory and offices of the West Mfg. Co. have been moved from Abilene, Kan., to Chicago. Sales headquarters for the company are at 447 Monadnock Block, Chicago. The West Mfg. Co. makes the Anderson Trouble-Finder, which was put on the market in 1919 and has been sold to wire companies in all parts of the world. Clarence Anderson, inventor of the device, and head of the West Mfg. Co., made a very successful showing of the trouble-finder at the recent Chicago Independent convention.

The Anderson trouble-finder is an extremely useful device for detecting line trouble by means of a finder coil. The many different testing features embodied in the trouble-finder make it a most practical and valuable device for locating various forms of line trouble such as "shorts," "grounds," "crosses," "opens," "swinging trouble," "leaky arrester carbons," "faulty ground rods," "defective windings," etc. This trouble-finder is used without cutting the wires.

Canterbury, N. H.—Canterbury and Loudon Telephone Co. has been organized here with Samuel S. Conant, George C. Asby and Herman R. Colby of Franklin as incorporators.

COMPARE!!!

then you plainly see the superiority of

R-L cords

YOU may not have a laboratory that will make telling tests of the quality of material that goes into telephone cords. You don't need one! Runzel-Lenz puts every ounce of raw material to the most severe tests in its own laboratories, specially equipped for determining just "what's what" in the products that go to make telephone cords. For more than a quarter of a century we have picked nothing but the best to go into R-L cords. We had to, in order to make our cords so much better that they **alone** would build a good, big business for us.

WITHOUT a testing laboratory you can put R-L cords to a test that plainly shows what's in them. The tests can be made right on your own boards and instruments. Note the performance of R-L cords carefully. You are bound to see that standardization of R-L cords will mean a saving worth-while in the course of a year.

Send for the complete R-L catalog which gives details of all of the R-L cords for telephone use.

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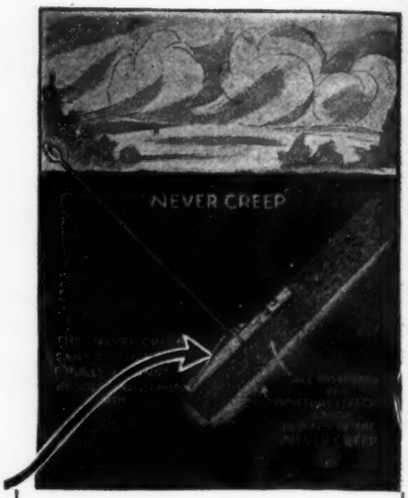

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Never-Creep Anchors

Have Superior Holding Power

In sandy, moist, adobe, or any other soils, the great holding surface of the NEVER-CREEP and its pull against solid, undisturbed earth gives an anchorage that is unsurpassed.

The more you look into anchor construction and performance the more you realize that undisturbed earth to pull against is a vital consideration. Tamping very seldom suffices to give the holding condition an anchor needs. Moisture seeps down to the holding plate of the anchor and collects there with a great sacrifice of the anchor's rigidity. You know how these factors ruin holding power, so play safe by standardizing the NEVER-CREEP and get away from the perils that are bound to come when the earth is disturbed during anchor installation.

The NEVER-CREEP alone has the Thimbleye rod.

Foremost wire companies prefer the NEVER-CREEP. So will you when you learn its complete story. Write us for details.

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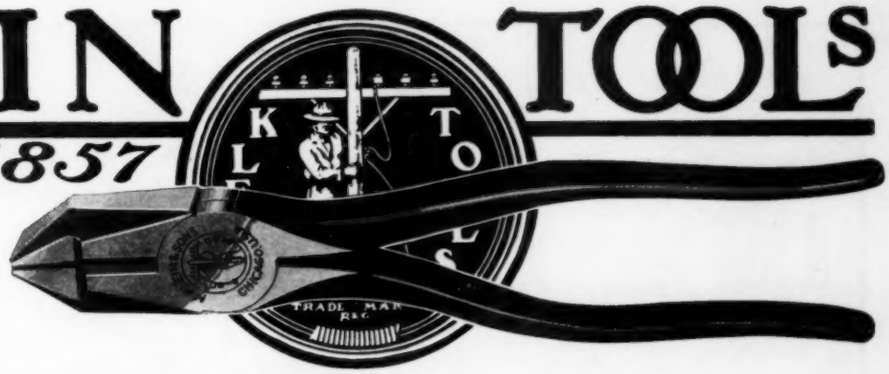

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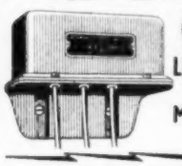

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Dean Common Battery Straight line steel hotel sets @	$ 5.00
Dean Common Battery Steel hotel sets with 16-33-50 or 66 cycle ringers @	5.50
Kellogg No. 2696 type 3-bar 1000 ohm Bdg. compacts @ $8.00—4-bar 1000 or 1600 ohm $9.00—5-bar @	9.75
Stromberg No. 599 type 4-bar 1600 ohm Bdg. compacts @	6.90
Kellogg No. 39 Common battery desk sets with No. 75 straight line steel bell box @	6.75
Kellogg No. 97 Common battery desk sets with No. 75 Straight line steel bell box @ $8.00—Harmonic with 16-33-50 or 66 cycle ringer @	8.50
Stromberg 1000 ohm self contained ringers with gongs @	1.35
Kellogg, Stromberg or Western Elec. 1600 ohm self contained ringers with gongs @	1.50
Kellogg No. 28 type 3-bar 1000 or 1600 ohm Bdg. desk set @ $10.00—4-bar $11.00—5-bar @	12.00
Western Elec. No. 20 desk stand with Kellogg Trans. and Rec. and 3-bar 1000 or 1600 signal set @ $10.00—4-bar @ $11.00—5-bar @	12.00
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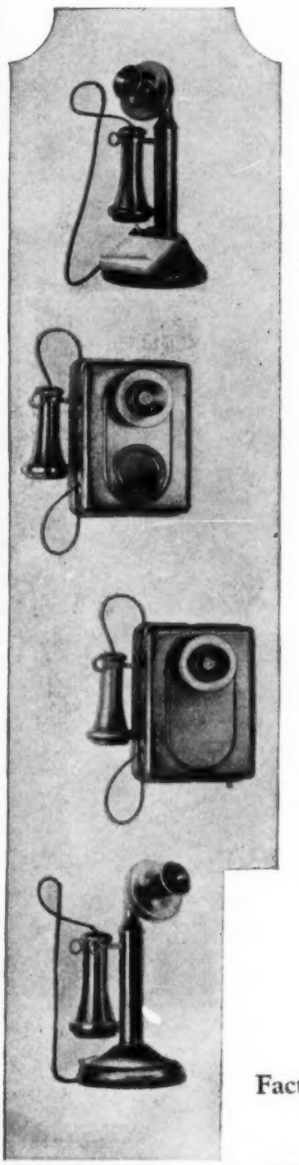

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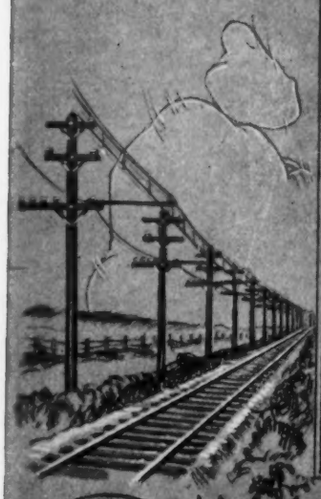

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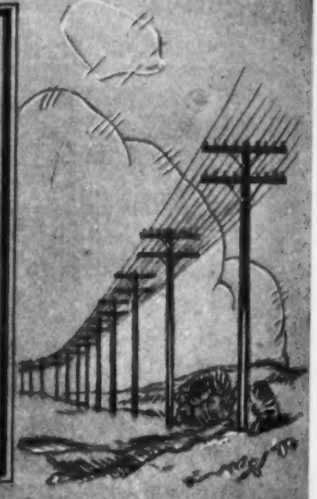

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